Florida Department of Environmental Protection

Memorandum

TO: Trina Vielhauer

THROUGH: Al Linero

FROM: David Read

DATE: May 24, 2010

SUBJECT: DEP File No. 1110138-001-AC
Geoplasma-St. Lucie, LLC
St. Lucie Plasma Gasification Waste-to-Energy Facility

Attached for your review is the Draft Air Construction Permit package for the Geoplasma-St. Lucie, LLC Plasma Gasification Waste-to-Energy (WTE) Facility that will be located in St. Lucie County. The proposed facility will be located on a parcel of land approximately 9 acres in size within the boundary of the existing St. Lucie County's Sanitary Landfill. The landfill is located off of Glades Cut-Off Road south of the crossing of Interstate 95 and the Florida Turnpike and approximately 8 miles southwest of the City of Fort Pierce.

This project is not subject to the rules for the Prevention of Significant Deterioration. We recommend your approval of the attached draft permit package.

Attachments

TLV/aal/dlr

PROFESSIONAL ENGINEER CERTIFICATION STATEMENT

Permittee:
Geoplasma-St. Lucie, LLC
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

DEP File No. 1110138-001-AC
St. Lucie Plasma Gasification Project
Waste-to-Energy (WTE) Facility
St Lucie County, Florida

Project: This project is to construct a 24 megawatt (MW, gross) plasma arc gasification-based WTE facility and ancillary equipment. The plasma arc gasification system will process up to 686 tons per day of municipal solid waste (MSW), tires with steel belts and other permitted feedstocks to produce a synthetic gas (syngas) consisting primarily of carbon monoxide (CO) and hydrogen (H_2) as the fuel components. The syngas will be combusted in a multi-stage thermal oxidizer followed by a heat recovery steam generator (HRSG) to generate high pressure, high temperature steam to drive a steam turbine-generator (STG) providing electrical energy to the grid.

Air pollution control equipment includes an electrostatic precipitator (ESP), a selective catalytic reduction (SCR) unit, powdered activated carbon injection (PACI) system with a fabric filter baghouse, and a flue gas desulfurization (FGD) scrubber.

The key applicable emission limits and monitoring requirements are those required pursuant to 40 Code of Federal Regulations (CFR), Part 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors. The applicant proposed and the permit incorporates additional requirements that insure that the project will not constitute a major stationary (PSD) source. Continuous emissions monitoring systems (CEMS) will be required for nitrogen oxides (NO_X), CO, mercury (Hg), sulfur dioxide (SO_2). A continuous opacity monitor system (COMS) will be required for visible emissions (VE).

This is the first large scale project utilizing plasma arc technology to gasify MSW to generate electrical power in the United States. Of particular note are the applicant's proposals to achieve long-term Hg and NO_X limits that are about one-tenth of the limits given in Subpart Eb.

The Department reviewed an air quality analysis prepared by the applicant. The Department has concluded that emissions from the project will not cause or contribute to a violation of any state or federal ambient air quality standards.

I HEREBY CERTIFY *that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, geological, and meteorological features). The concept of large scale plasma gasification of MSW is new and I have not evaluated and do not certify the efficacy of this process to produce a steady stream of syngas for combustion in a thermal oxidizer and efficient energy recovery as described in the application. Per 403.061(18), Florida Statutes, my employer, the Florida DEP has the power and the duty to encourage and conduct studies, investigations, and research relating to pollution and its causes, effects, prevention, abatement, and control.*

ALVARO A LINERO
LICENSE
NO. 26032
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Alvaro A. Linero, P.E. (Date) 5/20/2010
Registration Number: 26032

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Electronically Sent – Received Receipt Requested.

hillestad@geoplasma.com
Dr. Hilburn O. Hillestad
Geoplasma-St. Lucie, LLC
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

Re: DEP File No. 1110138-001-AC
St. Lucie Plasma Gasification Project
Waste-to-Energy Facility

Dear Mr. Hillestad:

On December 17, 2009, you submitted an application for an air construction permit subject to the preconstruction review requirements of Rule 62-212.300, Florida Administrative Code (F.A.C.). The purpose of the project is to construct a gross 24 megawatt (MW) plasma arc gasification Waste-to Energy (WTE) facility that will be located in St. Lucie County at St. Lucie County's Sanitary Landfill.

Enclosed are the following documents: Written Notice of Intent to Issue Air Permit; Public Notice of Intent to Issue Air Permit; Technical Evaluation and Preliminary Determination; and a Draft Permit with Appendices.

The Public Notice of Intent to Issue Air Permit is the actual notice that you must have published in the legal advertisement section of a newspaper of general circulation in the area affected by this project.

If you have any questions, please contact A. A. Linero, Program Administrator at (850) 921-9523 or David Read, the project engineer, at (850) 414-7268.

Sincerely,

Trina L Vielhauer 5/25/10

Trina Vielhauer, Chief
Bureau of Air Regulation
(Date)

TLV/aal/dlr

Enclosures

WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

In the Matter of an
Application for Air Permit by:

Dr. Hilburn O. Hillestad
Geoplasma-St. Lucie, LLC
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

DEP File No. 1110138-001-AC
St. Lucie Plasma Gasification Project
WTE Facility
St. Lucie County, Florida

Facility Location: The proposed Geoplasma-St. Lucie, LLC Plasma Gasification WTE Facility will be located in St. Lucie County on a parcel of land approximately 9 acres in size within the boundary of the existing St. Lucie County Sanitary Landfill. The landfill is located off of Glades Cut-Off Road south of the crossing of Interstate 95 and the Florida Turnpike and approximately 8 miles southwest of the City of Fort Pierce.

Project: The project involves the construction of a gross 24 megawatt (MW) plasma arc gasification WTE facility and ancillary equipment. A review pursuant to the rules for Prevention of Significant Deterioration (PSD) and a determination of best available control technology (BACT) pursuant to Rule 62-212.400, F.A.C. were not required.

Permitting Authority: Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210 and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Florida Department of Environmental Protection's Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Bureau of Air Regulation's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Bureau of Air Regulation's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Bureau of Air Regulation's telephone number is 850/488-0114.

Project File: A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above.

Notice of Intent to Issue Air Permit: The Permitting Authority gives notice of its intent to issue an air construction permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of the proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

Public Notice: Pursuant to Section 403.815, F.S. and Rules 62-110.106 and 62-210.350, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Permit (Public Notice). The Public Notice shall be published one time only as soon as possible in the legal advertisement section of a newspaper of general circulation in the area affected by this project. The newspaper used must meet the requirements of Sections 50.011 and 50.031, F.S. in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Written Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation: Mediation is not available in this proceeding.

Executed in Tallahassee, Florida

Trina Vielhauer, Chief
Bureau of Air Regulation

5/25/10
(Date)

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Written Notice of Intent to Issue Air Permit package (including the Public Notice, the Technical Evaluation and Preliminary Determination, and the Draft Permit) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on 5/25/10 to the persons listed below.

Dr. Hilburn O. Hillestad, Geoplasma-St. Lucie, LLC: hillestad@geoplasma.com
Leonard Shapiro, Energy Resources Group, Inc.: lshapiro@energyresourcesgrp.com
Ron Roberts, St. Lucie County: robertsr@stlucieco.gov
Scott H. Osbourn, P.E., Golder Associates, Inc: sosbourn@golder.com
Doug Neeley, EPA Region 4: neeley.doug@epa.gov
Heather Abrams, EPA Region 4: abrams.heather@epa.gov
Lennon Anderson, SED: lennon.anderson@dep.state.fl.us.
David Mickey, Blue Ridge Environmental Defense League: davidmickey@bellsouth.net
Vickie Gibson, DEP BAR Reading File: victoria.gibson@dep.state.fl.us

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk)

5/25/10
(Date)

the Permitting Authority at above address or phone number. Pursuant to Rule 62-110.106(5) and (9), F.A.C., the applicant shall provide proof of publication to the Permitting Authority at the above address within 7 days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rule 62-110.106(11), F.A.C.

Comments: The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of the Public Notice. Written comments must be received by the Permitting Authority by close of business (5:00 p.m.) on or before the end of the 14-day period. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

Petitions: A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the applicant or any of the parties listed below must be filed within 14 days of receipt of this Written Notice of Intent to Issue Air Permit. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 14 days of publication of the attached Public Notice or within 14 days of receipt of this Written Notice of Intent to Issue Air Permit, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with
Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of when and how each petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

Florida Department of Environmental Protection
Division of Air Resource Management, Bureau of Air Regulation
DEP File No. 1110138-001-AC
Geoplasma-St. Lucie, LLC Plasma Gasification Project
Waste-to-Energy (WTE) Facility
St. Lucie County

Applicant: The applicant for this project is Geoplasma-St. Lucie, LLC. The applicant's authorized representative and mailing address are: Dr. Hilburn O. Hillestad, 171 17th Street NW, Suite 1550, Atlanta, Georgia 30363.

Facility Location: The proposed Geoplasma-St. Lucie, LLC WTE Facility will be located in St. Lucie County on a parcel of land approximately 9 acres in size within the boundary of the existing St. Lucie County Sanitary Landfill. The landfill is located off of Glades Cut-Off Road south of the crossing of Interstate 95 and the Florida Turnpike and approximately 8 miles southwest of the City of Fort Pierce.

Project: This WTE project involves the construction of a gross 24 megawatt (MW) plasma arc gasification WTE facility and ancillary equipment. The plasma arc gasification system will process municipal solid waste (MSW), tires with steel belts and other permitted feedstocks to produce a synthetic gas (syngas) consisting primarily of carbon monoxide (CO) and hydrogen (H_2) as the fuel components. The syngas will be combusted in a multi-stage thermal oxidizer followed by a heat recovery steam generator (HRSG) to generate high pressure, high temperature steam to drive a steam turbine-generator (STG) providing electrical energy to the grid.

This is the first large scale project utilizing plasma arc technology to gasify MSW to generate electrical power in the United States. The facility will gasify up to 686 tons per day of MSW, tires with steel belts and other permitted feedstocks. Per 403.061(18), Florida Statues (F.S.), the Department has the power and the duty to encourage and conduct studies, investigations, and research relating to pollution and its causes, effects, prevention, abatement, and control.

The project consists of the following major equipment components: feedstock receiving and sorting systems; material handling systems; plasma arc gasifier; emergency flare system; multi-stage thermal oxidizer; HRSG; high efficiency STG; auxiliary boiler; emergency diesel generator; and diesel fire engine water pump.

The project will result in emissions increases of: 46.3 tons per year (TPY) of CO; 50 TPY of nitrogen oxides (NO_X); 38 TPY of particulate matter (PM); 37.6 TPY of PM with a mean diameter of 10 micrometers (μm) or less (PM_{10}); 17.5 TPY of sulfur dioxide (SO_2); 34.1 TPY of volatile organic compounds (VOC); negligible amounts of lead (Pb) and mercury (Hg); and 18.9 TPY of hydrogen chloride (HCl) a hazardous air pollutant (HAP). Because the potential emissions are below the major source thresholds, a review for the Prevention of Significant Deterioration (PSD) and a best available control technology (BACT) determination were not required. Emissions of an individual HAP (HCl) exceeds 10 TPY, but a case-by-case maximum achievable control technology (MACT) determination was not required because the plasma arc gasifier and multi-stage thermal oxidizer associated with the project are subject to the New Source Performance Standards (NSPS), 40 Code of Federal Regulations (CFR), Part 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors of Section 129 under the clean air act (CAA).

To meet the requirements of Subpart Eb and to insure that emissions are less than the major source threshold for PSD and that compliance is achieved with other applicable NSPS and other permitted emission limits, the Department requires installation and operation of the following air pollution control equipment and practices at the facility: an electrostatic precipitator and a fabric filter (PM and PM_{10}); good combustion practices (CO and VOC); selective catalytic reduction (NO_X, mercury (Hg) and dioxin/furan); powdered activated carbon injection (Hg and other metal HAP); and flue gas desulfurization (SO_2, sulfuric acid mist

(SAM) and acid gas HAP such as HCl). In addition, reasonable precautions as defined by a best management practices (BMP) plan will be required to control fugitive dust and other emissions associated with MSW, tires and other material receiving, storage, sorting and processing.

The Department will require that continuous emissions monitoring systems (CEMS) be installed for NO_X, SO_2, CO and Hg emissions and that a continuous opacity monitoring system (COMS) be installed for visible emissions (VE). Emissions from the auxiliary boiler, the emergency generator and the fire engine water pump will be controlled by: use of clean fuels; good combustion; and, design and compliance with applicable NSPS.

The Department reviewed an air quality analysis prepared by the applicant. The analysis demonstrated that ground-level concentrations of nitrogen dioxide (NO_2), PM_{10}, CO and SO_2 caused by the project, including background concentrations, will be much less than the respective National or Florida ambient air quality standards (AAQS).

Permitting Authority: Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, F.S. and Chapters 62-4, 62-210 and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Permitting Authority responsible for making a permit determination for this project is the Bureau of Air Regulation in the Department of Environmental Protection's Division of Air Resource Management. The Bureau of Air Regulation's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Bureau of Air Regulation's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Bureau of Air Regulation's telephone number is 850/488-0114.

Project File: A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the physical address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application and information submitted by the applicant (exclusive of confidential records under Section 403.111, F.S.). Interested persons may contact the Permitting Authority's project engineer for additional information at the address and phone number listed above. In addition, electronic copies of these documents are available on the following web site:

www.dep.state.fl.us/Air/emission/construction/geoplasma.htm

Notice of Intent to Issue Air Permit: The Permitting Authority gives notice of its intent to issue an air construction permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of the proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

Comments: The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of this Public Notice. Written comments must be received by the Permitting Authority by close of business (5:00 p.m.) on or before the end of the 14-day period. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

Petitions: A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection at 3900

Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000 (Telephone: 850/245-2241). Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S. must be filed within 14 days of publication of this Public Notice or receipt of a written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address and telephone number of the petitioner; the name address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of when and how the petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Public Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation: Mediation is not available for this proceeding.

TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Geoplasma St. Lucie, LLC
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

St. Lucie Plasma Gasification Project
ARMS Facility ID No. 1110138

PROJECT

Project No. 1110138-001-AC
24 Megawatt (gross) Waste-to-Energy (WTE) Facility
(686 Tons per Day Resource Recovery Facility)

COUNTY

St. Lucie County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
Special Projects Section
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

May 25, 2010

1. APPLICATION INFORMATION

1.1. Applicant Name and Address

Geoplasma-St. Lucie, LLC (Geoplasma)
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

Authorized Representative: Dr. Hilburn O. Hillestad

1.2. Key Dates

- December 17, 2009 Received air construction permit application from Geoplasma.
- January 16, 2010 Department issued request for additional information (RAI).
- February 23, 2010 Received response to RAI from Geoplasma.
- May 25, 2010 Department distributed Draft Permit package and posted documents.

1.3. Facility Location

The proposed Geoplasma Waste-to-Energy (WTE) facility will be located in St. Lucie County on a parcel of land approximately 9 acres in size within the boundary of the existing St. Lucie County Baling & Recycling Facility (SLCBRF). The location of St Lucie County (shown in red) and the proposed site within the County are shown below in Figures 1 and 2, respectively.

Figure 1 – St. Lucie County, Florida

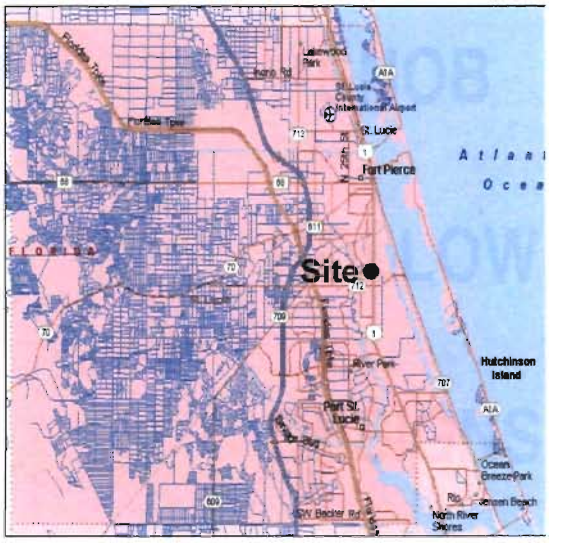

Figure 2 – Map of St. Lucie County, Location of Facility

A satellite view and map of the site and the immediate environs are visible at the following link:

Satellite View of St. Lucie County Sanitary Landfill, Site of Future Geoplasma WTE Site

The site is located off Glades Cut-Off Road south of the intersection of Interstate 95 and the Florida Turnpike and approximately 8 miles southwest of the City of Fort Pierce.

2. EXISTING LANDFILL OPERATION

To fully understand the proposed project, it is useful to first understand the existing operation at the SLCBRF. The following description is based on information available at the solid waste link of the St. Lucie County Board of County Commissioners website at: www.stlucieco.gov/solid_waste/index.htm .

The SLCBRF receives and processes solid waste products from residents and commercial properties in the County and processes roughly 600 tons per operating day (TPD) of Class I waste, 100 TPD of construction and demolition (C&D) debris and 140 TPD of yard waste.

Refer to Figures 3 and 4. Arriving garbage trucks containing Class I municipal solid waste (MSW) are weighed and sent to the tipping floor of the baling facility and unloaded of all its collected refuse. Material is sorted by categories of recyclable items such as wood, metal, electronics, tires, cardboard, propane tanks, chemicals, drums, etc. Remaining refuse is pushed to a set of floor conveyers and moved to the baling room where it is compressed, baled, loaded onto trucks, and transported to the landfill.

Figure 3. Scale House, Tipping Floor, Baling Room, Outdoor Bale Stacking at "Balefill"

C&D waste is kept separate from the Class I waste and is sent to the separate C&D recycling facility. Pieces of debris such as wood, concrete and metal are removed after which the sorted pile is placed onto a conveyor and sent through the recycling equipment. The recycling steps consist of picking lines to manually remove recyclable items, a star screen to remove concrete, rocks and dirt, two magnetic conveyors and additional picking lines.

Figure 4. C&D Waste Handling, Grinder, Landfill Leachate Collection Pond, LFG Flare

All of the items removed from the Class I and C&D streams are collected and recycled. Metal is stored for processing. Wood is shredded, piled, and shipped to a cogeneration power plant and used as boiler fuel. Electronics are palletized and placed onto a semitrailer for subsequent transportation.

Yard waste is collected at a designated area and is composted.

The existing facility has a Title V Operation Permit that includes the requirements of 40 Code of Federal Regulations (CFR) Part 60, Subparts Cc and WWW. As required by Subparts Cc and WWW, the landfill gas (LFG) generated by decomposing waste is collected through an active collection system consisting of 90 wells. The LFG is piped to a local juice maker for use as boiler fuel.

3. PROPOSED PROJECT

3.1. Project Description

The applicant proposes to construct a 24 megawatts (MW, gross) WTE facility at the SLCBRF. From a regulatory point of view it will be a nominal 686 tons per day (TPD) municipal waste combustor or resource recovery facility.

Basically, Geoplasma will take over responsibility of the operation beyond the scale house and will gasify solid waste (such as Class I waste, C&D waste, tires and yard trash) in a plasma arc gasification vessel equipped with plasma torches as described below. The total maximum feedstock throughput will be 686 tons per day of the described waste and metallurgical coke. The resulting synthetic gas (syngas) gas will be combusted in a multi-stage thermal oxidizer (TO). The heat generated will be transferred to a heat

recovery steam generator (HRSG). The resulting high pressure, high temperature (HPHT) steam will be expanded in a steam turbine generator (STG) to generate electrical power, some of which will be used on-site and some of which will be sold to the grid.

The facility will be comprised of seven process areas:

- Material handing: consisting of feedstock (MSW, tires with steel belts and other permitted materials), metallurgical coke (coke), limestone, ammonia and powered activate carbon (PAC) delivery, conveying and storage;
- Process byproduct handing: consisting of fly ash, spent PAC, gypsum and vitrified material conveying and storage;
- Plasma arc gasifier (PAG): where feedstock is gasified into syngas, the energetic components of which are primarily hydrogen (H_2) and carbon monoxide (CO);
- Power island (steam generating unit): consisting of a multi-stage TO to combust the syngas, a HRSG and a STG;
- Air pollution control equipment: including an electrostatic precipitator (ESP), a selective catalytic reduction (SCR) unit, powdered activated carbon injection (PACI) system with a fabric filter baghouse, and a flue gas desulfurization (FGD) scrubber;
- Emergency flare system: for temporary and infrequent disposal of bypasses syngas; and
- Emergency support equipment: consisting of a generator, fire pump engine and an auxiliary boiler.

The location of the proposed Geoplasma facility within the SLCBRF property is shown in Figure 5 below. The figure includes a preliminary layout of key components that has since been updated as shown in Figure 6.

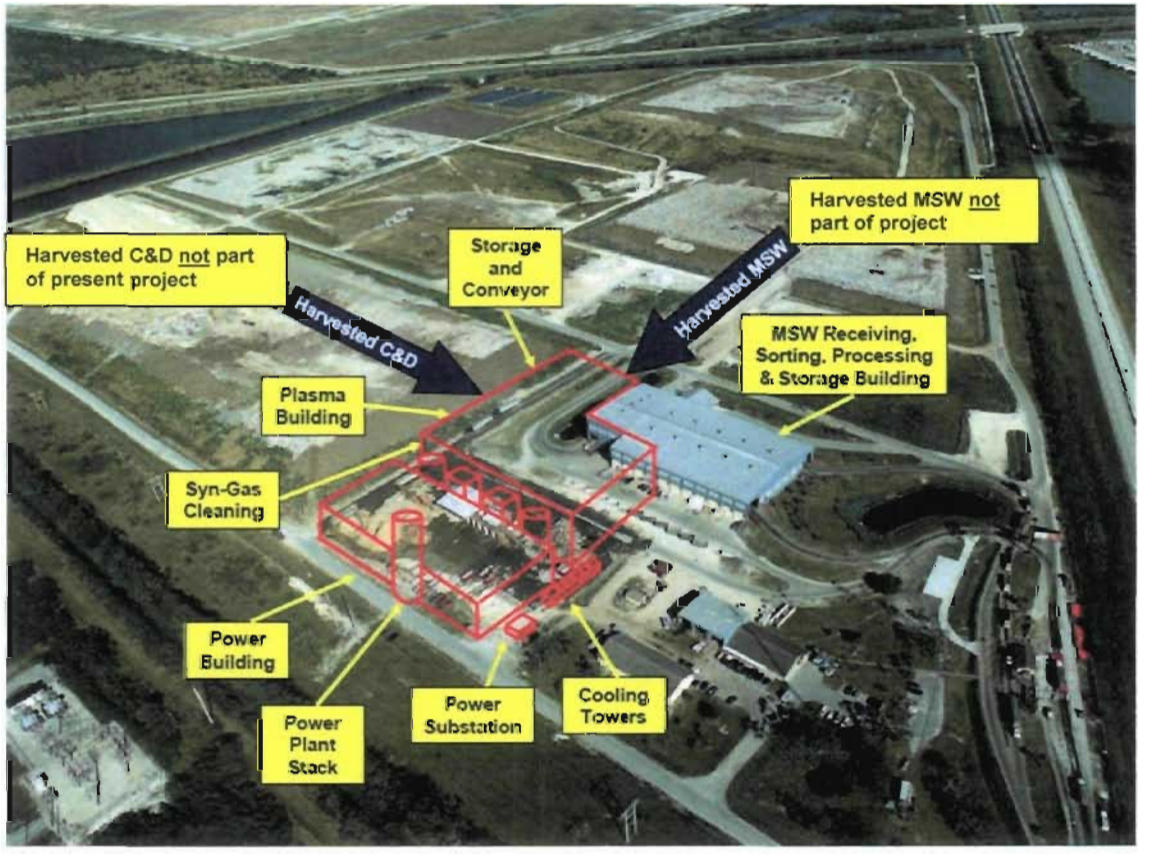

Figure 5 – Proposed Geoplasma WTE Facility at St Lucie County Sanitary Landfill

Figure 6 – Proposed Layout of the Geoplasma WTE Facility

3.2. Fuel Feedstock

The bulk of the solid waste is best described as MSW. The affected source is called a municipal waste combustor (MWC) in the key rule applicable to the project which is 40 CFR 60, Subpart Eb - Standards of Performance for Large Municipal Waste Combustors.

MSW includes the items and materials that fit within the definition of MSW contained in either Section 403.706(5), Florida Statutes (F.S.) or 40 CFR 60.51b. The two definitions are as follows:

[Section 403.706(5), F.S.] As used in this section, "municipal solid waste" includes any solid waste, except for sludge, resulting from the operation of residential, commercial, governmental, or institutional establishments that would normally be collected, processed, and disposed of through a public or private solid waste management service. The term includes yard trash but does not include solid waste from industrial, mining, or agricultural operations.

[40 CFR 60.51b, Definitions] Municipal solid waste or municipal-type solid waste or MSW means household, commercial/retail, and/or institutional waste. Household waste includes material discarded by single and multiple residential dwellings, hotels, motels, and other similar permanent or temporary housing establishments or facilities. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, nonmanufacturing activities at industrial facilities, and other similar

establishments or facilities. Institutional waste includes material discarded by schools, nonmedical waste discarded by hospitals, material discarded by nonmanufacturing activities at prisons and government facilities, and material discarded by other similar establishments or facilities. Household, commercial/retail, and institutional waste does not include used oil; sewage sludge; wood pallets; construction, renovation, and demolition wastes (which includes but is not limited to railroad ties and telephone poles); clean wood; industrial process or manufacturing wastes; medical waste; or motor vehicles (including motor vehicle parts or vehicle fluff). Household, commercial/retail, and institutional wastes include: (1) Yard waste; (2) Refuse-derived fuel; and (3) Motor vehicle maintenance materials limited to vehicle batteries and tires except as specified in §60.50b(g).

The Subpart Eb MSW definition relates more to the wastes that, if combusted, would make the source subject to the given rule rather than a strict delineation of what can and cannot be processed in a MWC. The Department clarifies in its MWC permits the fuel slates on a project-by-project basis.

Following is an example of a typical fuel slate for a WTE facility in Florida. The actual fuel slate for the Geoplasma facility will be stated in the permit.

1. The facility shall not burn any of the following materials:
   a) those materials that are prohibited by state or federal law;
   b) those materials that are prohibited by this permit;
   c) lead acid batteries;
   d) hazardous waste;
   e) nuclear waste;
   f) radioactive waste;
   g) sewage sludge;
   h) explosives; and
   i) beryllium-containing waste, as defined in 40 CFR 61, Subpart C.
2. Further, the facility shall not knowingly burn:
   a) nickel-cadmium batteries pursuant to Section 403.7192 (3);
   b) mercury containing devices and lamps pursuant to Sections 403.7186(2) & (3);
   c) untreated biomedical waste from biomedical waste generators regulated pursuant to Chapter 64E-16, F.A.C., and from similar generators (or sources);
   d) segregated loads of biological waste; and
   e) CCA treated wood.
3. The following other solid waste may be used as fuel at the facility:
   a) confidential, proprietary or special documents (including but not limited to business records, lottery tickets, event tickets, coupons and microfilm);
   b) contraband which is being destroyed at the request of appropriately authorized local, state or federal governmental agencies, provided that such material is not an explosive, a propellant, a hazardous waste, or otherwise prohibited at the facility. For the purposes of this determination, contraband includes but is not limited to drugs, narcotics, fruits, vegetables, plants, counterfeit money, and counterfeit consumer goods;
   c) wood pallets, clean wood, and land clearing debris;
   d) packaging materials and containers;
   e) clothing, natural and synthetic fibers, fabric remnants, and similar debris, including but not limited to aprons and gloves;

f) rugs, carpets, and floor coverings, but not asbestos-containing materials or polyethylene or polyurethane vinyl floor coverings;

g) construction and demolition debris.

h) oil spill debris from aquatic, coastal, estuarine or river environments. Such items or materials include but are not limited to rags, wipes, and absorbents.

i) items suitable for human, plant or domesticated animal use, consumption or application where the item's shelf-life has expired or the generator wishes to remove the items from the market. Such items or materials include but are not limited to off-specification or expired consumer products, pharmaceuticals, medications, health and personal care products, cosmetics, foodstuffs, nutritional supplements, returned goods, and controlled substances.

j) consumer-packaged products intended for human or domesticated animal use or application but not consumption. Such items or materials include but are not limited to carpet cleaners, household or bathroom cleaners, polishes, waxes and detergents.

k) waste materials that:

   i. are generated in the manufacture of items in categories (c) or (d), above and are functionally or commercially useless (expired, rejected or spent); or

   ii. are not yet formed or packaged for commercial distribution. Such items or materials must be substantially similar to other items or materials routinely found in MSW.

l) waste materials that contain oil from:

   i. the routine cleanup of industrial or commercial establishments and machinery; or

   ii. spills of virgin or used petroleum products. Such items or materials include but are not limited to rags, wipes, and absorbents.

m) used oil and used oil filters. Used oil containing a PCB concentration equal or greater than 50 ppm shall not be burned, pursuant to the limitations of 40 CFR 761.20(e).

n) waste materials generated by manufacturing, industrial or agricultural activities, provided that these items or materials are substantially similar to items or materials that are found routinely in MSW, subject to prior approval of the Department

3.3. Material Handling, Storage and Processing

Figure 7 provides a process flow diagram for the non-feedstock material handling operations at the Geoplasma facility. Particulate matter (PM) emission points are shown by the dashed arrows in the diagram. Handling of the MSW, tires and other permitted feedstocks are not expected to result in additional fugitive emissions and are not included in Figure 7. Key material handling operations, including feedstocks are briefly described below.

- *Feedstocks*: The project will utilize the existing SLCBRF building for initial processing of the MSW and the separation of recyclable materials. An enclosed conveyor system will be utilized to transport the MSW, tires and other feedstock materials from the existing processing area to the gasifier. Air for the gasifier and thermal oxidizer will be drawn through the waste processing area and conveyor to minimize the potential for odors and fugitive emissions from feedstock processing and recycling operations.

- *Coke*: Coke is required in the process as described below. Coke will be delivered to the project site via trucks and stored in a silo. The delivery trucks will each have an average net load of 25 tons of material. The storage silo will be pneumatically loaded and will be equipped with a bin vent fabric filter to minimize PM emissions during the unloading process. The coke will then be released into the gasifier feed system. Coke is projected to be consumed at a rate of approximately 2,000 pounds per hour (lb/hr) and 8,758 tons per year (TPY), which equates to approximately 350 truck deliveries per year.

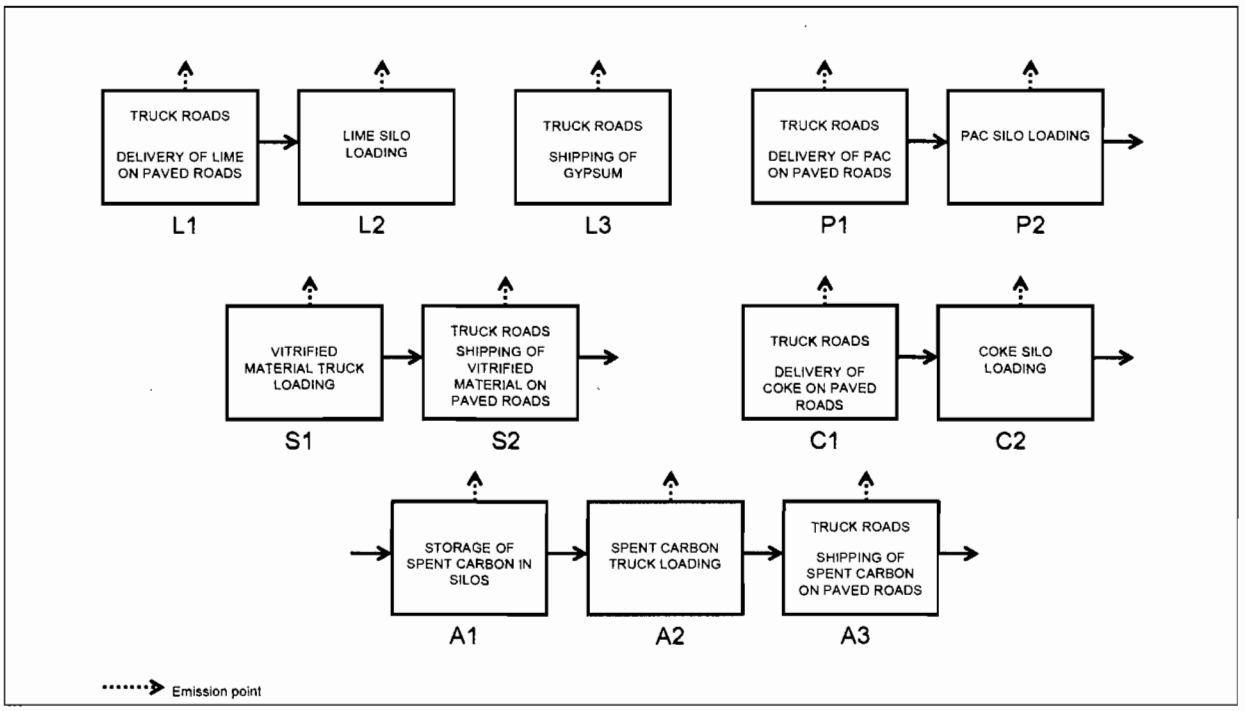

Figure 7 - Material Handling, Processing, and Storage Process Flow Schematic Diagram

- *Limestone*: Limestone is required in the process as a flux and in the FGD scrubber. Limestone will be delivered to the project site via trucks and stored in a silo. The delivery trucks will each have an average net load of 25 tons of material. The storage silo will be pneumatically loaded and will be equipped with a bin vent fabric filter to minimize PM emissions during the unloading process. The limestone will then be injected to the gasifier feed system and FGD system. Limestone is projected to be consumed at a rate of approximately 3,480 lb/hr in the gasifier (15,234 TPY) and 764 lb/hr (3,346 TPY) in the FGD system. A total of approximately 18,580 TPY will require approximately 743 truck deliveries per year.
- *Powdered activated carbon (PAC)*: PAC is required in the PACI system to control mercury (Hg), trace metals and complex organic compounds. A fabric filter bag house will be used to capture the spent carbon. PAC will be delivered to the project site via trucks and stored in a silo. The delivery trucks will each have an average net load of 25 tons of material. The storage silo will be pneumatically loaded and will be equipped with a bin vent fabric filter to minimize PM emissions during the unloading process. The PAC will then be injected into the flue gas stream ahead of the bag house. PAC is projected to be consumed at a rate of approximately 38 lb/hr and 167 TPY, which equates to approximately 7 truck deliveries per year.
- *Ammonia (NH_3)*: Aqueous ammonia is used in the SCR system. It will be delivered to the site by tank truck and stored in onsite tanks.

3.4. Gasification Process Description

The gasification process proposed by Geoplasma for the St. Lucie facility is based on technology developed by Westinghouse Plasma Corporation, a division of Alter, NRG. In the plasma gasification process developed by Westinghouse Plasma, MSW and other wastes such as tires are mixed with metallurgical coke and limestone and introduced into the top of a vertical cylindrical gasifier vessel similar to a cupola used in the metallurgical industry. The gasifier is heated by energy input devices called plasma torches located near the bottom of the vessel.

Figure 8 is a schematic of a Westinghouse Plasma torch. These have no moving parts. Incoming process gas such as air or oxygen is partially ionized whereby individual atoms are stripped of one or more electrons by an electrical discharge between the electrodes. The ionized process gas is further heated by passage through a magnetic field and exits in the plasma state reaching temperatures on the order of 10,000°F or greater.

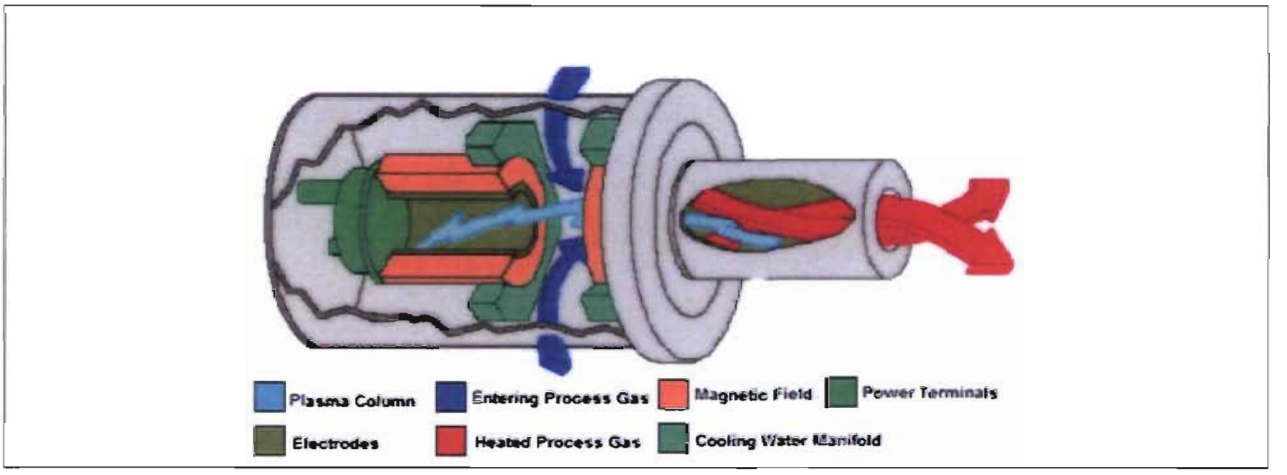

Figure 8. Schematic of Westinghouse Plasma Torch

The plasma torches do not directly contact the waste. The torches provide the high temperatures required in the cupola. For reference, the torches are available in sizes that can accommodate electrical power input up to 2.4 MW (Marc-11 at highest load). Their operation would constitute part of the parasitic load subtracted from the gross electrical output if used at a WTE plant.

Figure 9 is a schematic of one variation of the Alter NRG Plasma Gasification System based on the Westinghouse Plasma torch technology and pre-combustion syngas cleanup. The proposed project will incorporate post-combustion cleanup as described below.

As the waste moves downward through the gasifier, most of the carbon in the waste reacts with water and oxygen to primarily produce CO and lesser amounts of H_2, various hydrocarbons, reduced compounds such as NH_3, hydrogen sulfide (H_2S), etc. A large volume is required to provide the residence time needed to further crack difficult gasification products such as tars. The syngas is withdrawn from the top of the gasifier vessel and cleaned prior to beneficial use.

The inorganic (inert) components of the feedstock move downward to a porous bed formed by the coke introduced with the waste and are heated to very high temperature by the plasma torches. The inert materials are melted by the intense heat of the plasma torches, flow downward through the porous coke bed and are discharged as glass aggregate and metal nodules. The limestone added to the gasifier feedstock acts as flux to decrease the viscosity of the molten stream and facilitate flow through the porous coke bed.

A generalized explanation of how waste can be converted using plasma arc technology is available at:

http://science.howstuffworks.com/plasma-converter.htm

3.5. Syngas Combustion/Primary Pollution Control

Syngas such as from MSW, coal and biomass is combusted in a variety of equipment such as conventional boilers, engines and combustion turbines. Most modern applications familiar to the Department involve syngas cleanup prior to combustion. Thermal oxidizers (TO) such as proposed by Geoplasma are typically used to combust waste streams or to destroy air pollutants present in process exhaust gases at relatively low levels, such as CO and volatile organic compounds (VOC). Usually such applications require the use of supplementary fuel.

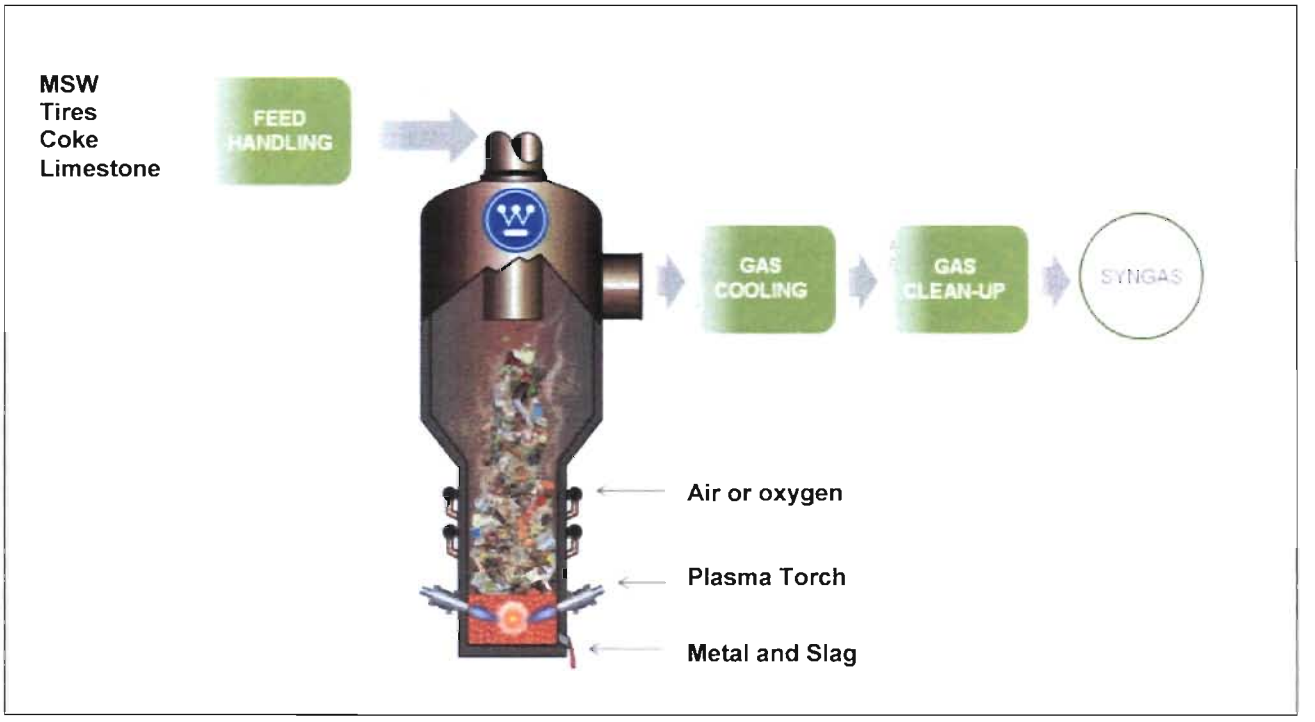

Figure 9 – Key Components of the Alter NRG Plasma Gasification System

In a typical TO application, the waste streams/pollutants react with oxygen in a temperature controlled environment, typically requiring additional fuel, to create an oxidation reaction. A waste heat boiler (such as a HRSG) may be located after the TO to extract the heat from the products of combustion to generate process (utility) steam.

A typical configuration for a fully integrated multi-stage TO system for the purpose of handling waste streams and destroying combustible air pollutants is shown in Figure 10 below. The application shown can accommodate liquid and gaseous waste streams as well as several supplementary fuels. A scrubber is provided downstream for subsequent acid gas control.

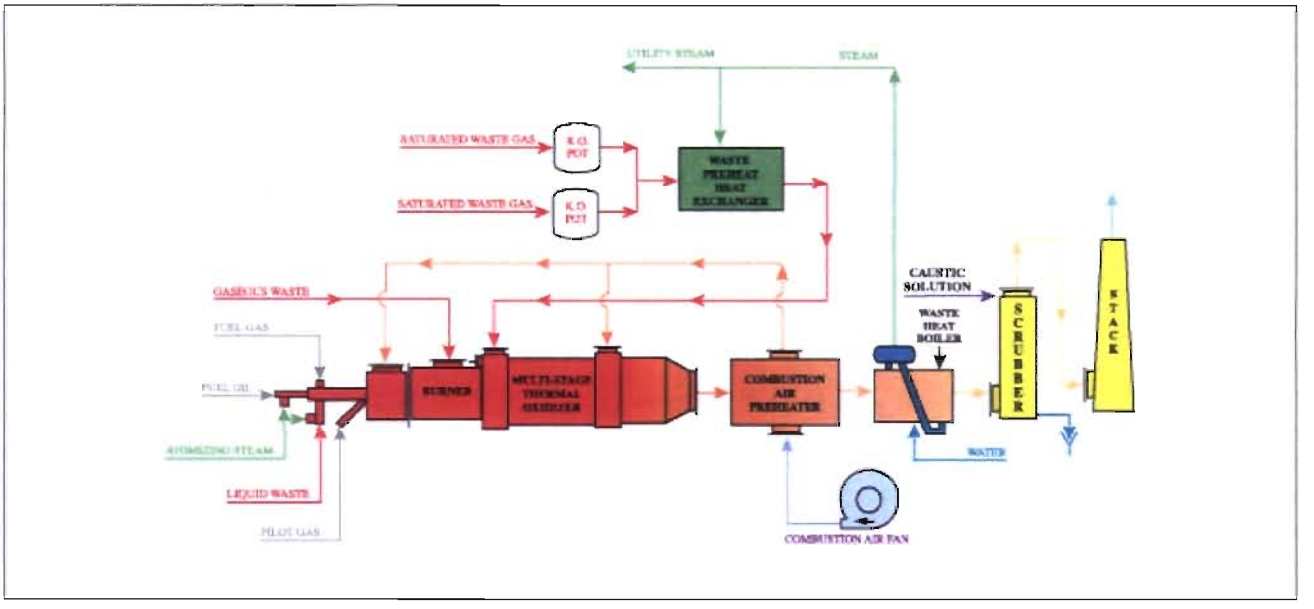

Figure 10 – Integrated TO for Waste Gas and Air Pollution Control (Process Combustion Corporation)

In the present application, a TO will be used wherein the waste stream and the supplementary fuel are one and the same (i.e. the syngas). Figure 11 is a general process flow diagram of the proposed St. Lucie Geoplasma facility. The syngas is combusted (prior to cleanup) in a multi-stage TO. Most of the heat from combustion is recovered in a HRSG to generate high pressure, high temperature (HPHT) steam to drive the STG (rather than as plant utility steam).

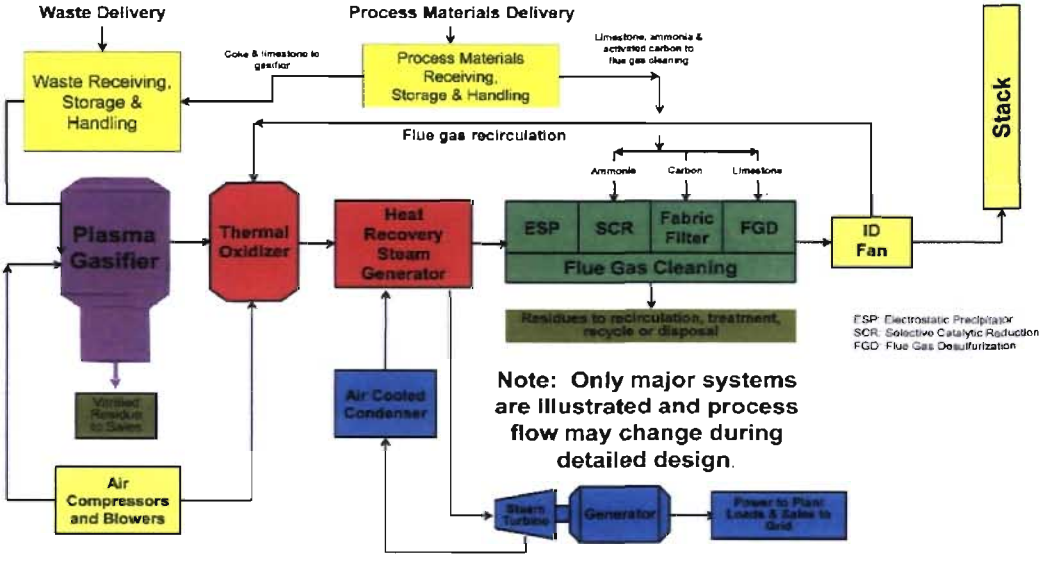

Figure 11 – Process Flow Diagram of St. Lucie Geoplasma WTE Facility

Geoplasma will use a type of multi-stage TO with reducing, conditioning and oxidizing sections. Flue gas recirculation (FGR) will be incorporated into the design and will help reduce nitrogen oxides (NO_X) formation. Overall, the combustion of the syngas in the described multi-stage TO provides the initial air pollution control for PM, NO_X, CO and VOC prior to the add-on control equipment described below.

3.6. Emergency Flaring System

According to the applicant, in the event of a sudden increase in the production of syngas in the gasifier that cannot be accommodated by the TO or the sudden unavailability of the TO, HRSG, emission control system or induced draft (ID) fans, it will be necessary to vent bypassed syngas to the emergency flare system. This will be accomplished by means of a flare stack designed to assure combustion of the syngas. The applicant does not anticipate that use of the flare system will be required during either normal start up or shutdown of the gasification system or during unplanned shutdowns, as the exhaust gas would continue to be directed through the thermal oxidizer and be subjected to all of the downstream pollution control systems. The applicant has requested that the emergency flaring system be allowed to operate for 10 hours per year consisting of 20 half-hour flaring events.

3.7. Electrostatic Precipitator (ESP)

Flue gas from the TO/HRSG will be further treated to remove: particulate matter (PM/PM_{10}); acid gases including sulfur dioxide (SO_2) and hydrogen chloride (HCl); NO_X; mercury (Hg) and other trace elements before being discharged to the atmosphere via a 125 foot (ft) stack.

A high temperature ESP will be located immediately downstream of the TO/HRSG to control PM/PM_{10} and to remove certain ash components such as sodium (Na), potassium (K), magnesium (Mg) and calcium (Ca), that can otherwise affect the additional downstream pollution control equipment, such as the SCR system.

3.8. SCR System

A SCR system will be located immediately downstream of the ESP and utilized to reduce and further control NO_X emissions. SCR reduces NO_X emissions by injecting liquid NH_3 solution into the flue gas in the presence of a catalyst.

NH_3 reacts with NO_X in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water according to the following simplified reaction:.

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$$

3.9. PACI System/Fabric Filter Baghouse

A PACI system will be located immediately downstream of the SCR system to control Hg, trace metals and complex organic compounds. The PACI will function in conjunction with a fabric filter (FF) baghouse located immediately downstream that will capture the spent carbon and pollutants absorbed therein. The FF baghouse will also provide additional removal of PM/PM_{10} and trace elements and ash not captured by the upstream ESP system.

3.10. FGD System

A wet FGD system, utilizing limestone will be installed to control emissions of acid gases, including sulfur dioxide (SO_2), hydrochloric acid (HCl) and hydrogen fluoride (HF). The limestone will be stored in a silo with a bin vent for loading. The limestone will be withdrawn from the bin and pneumatically conveyed to the flue duct downstream of the fabric filters. The SO_2 removal reactions are as follows:

SO_2 and water react to form sulfurous acid.

$$2SO_2 + H_2O \rightarrow H_2SO_4$$

Sulfurous acid reacts with limestone to form calcium sulfite, carbon dioxide and water.

$$H_2SO_3 + CaCO_3 \rightarrow CaSO_3 + CO_2 + H_2O$$

Calcium sulfite may be further oxidized to form gypsum.

$$2CaCO_3 + O_2 + 2H_2O \rightarrow CaSO_4 \bullet 2H_2O)$$

HCl and HF are water soluble and their removal is further enhanced by the limestone reagent.

3.11. Process By-Products

Process by-products will be generated at the Geoplasma facility. These process by-products are discussed below.

- *Vitrified Residue Material*: The gasification of feedstock, coke and limestone will result in the formation of vitrified (glass like) material that will be discharged from the bottom of the gasifier into water to produce a coarse sand-like aggregate that will be sold for use in construction. The wet vitrified material produced by the gasifier system will be loaded on to trucks for removal off-site. Vitrified material is expected to be produced at a rate of 13,200 lb/hr and 57,900 TPY which equates to approximately 2,300 truck shipments offsite per year.
- *Spent Carbon*: Spent carbon collected in the fabric filter baghouse will be transported via an enclosed conveyor or similar configuration to the spent carbon storage silo. The storage silo will be equipped with bin vent fabric filters to minimize PM emissions during the transfer operation. Spent carbon from the storage silo will be transported offsite for recycling and recovery.

- *Gypsum*: The FGD system will produce gypsum as a byproduct. Gypsum is typically used in production of wallboard and similar materials and will be shipped offsite for beneficial use in the wallboard industry. Gypsum is expected to be generated at a rate of approximately 900 lb/hr and 4,000 TPY, resulting in 160 truck shipments per year.

3.12. Additional Support Equipment

The proposed Geoplasma facility will also require:

- Up to four 1,000 gallon capacity above ground storage tanks for biodiesel and ultra low sulfur distillate (ULSD) fuel oil to support the emergency generator and emergency fire water pump engines;
- One 500 kilowatt (kW) emergency electrical generator (or smaller);
- One 335 horsepower (hp) emergency fire water pump engine (or smaller); and
- One natural gas fueled auxiliary boiler with a maximum heat input rate of 216 million British thermal units per hour (mmBtu/hr).

3.13. Emissions Units

Table 1 is a list of the Emissions Units (EU) that constitute this project.

Table 1 – List of Emissions Units for the Geoplasma WTE Facility

Facility ID 1110138	
EU No.	**Emission Unit Description**
001	Material handling consisting of: fuel feedstock (MSW, tires and other permitted materials); coke; limestone; PAC; and, process byproducts (vitrified residue, spent carbon and gypsum)
002	Plasma arc gasifier to generate syngas
003	Emergency syngas flaring system
004	Multi-staged thermal oxidizer fueled by syngas, a HRSG and a STG
005	Emergency generator fueled by biodiesel or ultra low sulfur distillate (ULSD) fuel oil
006	Emergency fire water pump engine fueled by biodiesel or ULSD fuel oil
007	Auxiliary boiler fueled by natural gas

4. ANNUAL EMISSIONS AND APPLICABLE REGULATIONS

The project will result in emissions of PM and PM_{10}, NO_X, SO_2, CO, VOC, fluoride (F), lead (Pb) and hazardous air pollutants (HAP) including dioxin/furan (D/F) and hydrogen chloride (HCl), cadmium (Cd) and mercury (Hg). Table 2 summarizes the applicant's estimates of the potential-to-emit (PTE) in TPY of key regulated air pollutants from the Geoplasma facility.

Table 2 - Estimated PTE of Key Air Pollutants (in TPY)

Source Operation	PM	PM_{10}	NO_X	SO_2	CO	VOC	Pb	HAP
Thermal Oxidizer	25	25	33	16	33	33	0.32	16.4
Flare System	11	11	<1	1.1	0.3	0.1	0	2
Support Equipment[1]	<0.5	<0.5	16	<0.5	13	1	0.03	0.5
Material Handling	1.5	1.1	0	0	0	0		0
Total	38.0	37.6	50.0	17.6	46.3	34.1	0.35	18.9[2]

1 Support equipment consists of the emergency generator, emergency fire water pump engine and auxiliary boiler.

2 Largest single HAP is hydrogen chloride (HCl) at a total of 18.9 TPY.

The applicant estimates Hg emissions at approximately 10.2 lb/yr. Because more than 10.0 TPY of HCl will be emitted, the facility is a major source of HAP.

4.1. State Regulations

The project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.) and to the following rules in the Florida Administrative Code (F.A.C.).

Table 3 – Key State Regulations Potentially Applicable to the Geoplasma Project

F.A.C. Chapter	Description
62-4	Permits
62-204	Air Pollution Control – General Provisions
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Stationary Sources - Preconstruction Review
62-213	Operation Permits for Major Sources of Air Pollution
62-214	Requirements for Sources Subject To the Federal Acid Rain Program
62-296	Stationary Sources - Emission Standards
62-297	Stationary Sources - Emissions Monitoring

4.2. Regulatory Classification

Following is a summary of the applicability of key regulations to the Geoplasma project.

Chapter 62-4, F.A.C. www.dep.state.fl.us/air/rules/fac/62-4.pdf

Rule 62-4.070(1), F.A.C., Standards for Issuing or Denying Permits; Issuance; Denial.

This rule applies to all permitting decisions:

- A permit shall be issued to the applicant upon such conditions as the Department may direct, only if the applicant affirmatively provides the Department with reasonable assurance based on plans, test results, installation of pollution control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules.

Chapter 62-204, F.A.C. www.dep.state.fl.us/air/rules/fac/62-204.pdf

Rule 62-204.220(1), F.A.C., Ambient Air Quality Protection.

This rule applies to all air permitting decisions.

- The Department shall not issue an air permit authorizing a person to build, erect, construct, or implant any new emissions unit; operate, modify, or rebuild any existing emissions unit; or by any other means release or take action which would result in the release of an air pollutant into the atmosphere which would cause or contribute to a violation of an ambient air quality standard established under Rule 62-204.240, F.A.C.

Rule 62-204.240, F.A.C., Ambient Air Quality Standards.

This rule applies to all air permitting decisions.

- Refer to list of pollutants and ambient air quality standards provided therein and discussed in the Ambient Air Quality Section of this evaluation.

Rule 62-204.800(8), F.A.C., Title 40, Code of Federal Regulations (CFR), Part 60, Standards of Performance for New Stationary Sources (NSPS).

The following provisions incorporated into Rule 62-204.800(8), F.A.C. adopted from federal regulations and incorporated into this rule apply to this project:

- 40 CFR 60, Subpart A – General Provisions;
- 40 CFR 60, Subpart Eb - Standards of Performance for Large Municipal Waste Combustors;
- 40 CFR 60, Subpart Db – Industrial, Commercial, Institutional Steam Generating Units; and
- 40 CFR 60, Subpart IIII – Stationary Compression Ignition Internal Combustion Engines (ICE).

Rule 62-204.800(11), F.A.C., 40 CFR 63, National Emission Standards for HAP (NESHAP).

The following provision incorporated into Rule 62-204.800(11), F.A.C. adopted from federal regulations and incorporated into this rule applies to this project:

- 40 CFR 63, Subpart A – General Provisions; and
- 40 CFR 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE).

Chapter 62-210, F.A.C. www.dep.state.fl.us/air/rules/fac/62-210.pdf

62-210.200, F.A.C., Definitions.

- The Geoplasma project is a major source of HAP because it has the PTE 10 TPY or more of any one HAP.
- The Geoplasma project is a Title V or "Major Source" of air pollution because it is a major source of HAP.
- The existing SLCBRF is not classified as a "Major Stationary Source" (PSD-source) because it does not emit and does not have a PTE 250 TPY or more of a PSD pollutant and is not one of the 28 facility categories listed in the definition with the PSD applicability threshold of 100 TPY.
- The proposed Geoplasma project is not a PSD-source because it will occur at a stationary source that is not a PSD-source and the project would not constitute a major stationary source by itself.

Rule 62-210.300, F.A.C., Permits Required.

- Unless exempted, the owner or operator of any facility or emissions unit which emits or can reasonably be expected to emit any air pollutant shall obtain appropriate authorization (i.e. a permit) from the Department prior to undertaking any activity at the facility or emissions unit for which such authorization is required.

Rule 62-210.350, F.A.C., Public Notice and Comment.

- A notice of proposed agency action on a permit application, where the proposed agency action is to issue the permit, shall be published by any applicant.
- The notice of intent to issue an air construction permit for this project shall provide a 14-day period for submittal of public comments.
- Additional public notice requirements for projects subject to PSD or Nonattainment-Area Preconstruction Review do not apply to this project.

Rule 62-210.700, F.A.C., Excess Emissions.

This rule applies to all air permitting decisions. Only the key provisions potentially affecting this project are listed.

- Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration.
- Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited.

- Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest.

Chapter 62-212, F.A.C. www.dep.state.fl.us/air/rules/fac/62-212.pdf

Rule 62-212.300, F.A.C., General Preconstruction Review Requirements.

- This rule generally applies to the construction or modification of air pollutant emitting facilities in those parts of the state in which the state ambient air quality standards are being met.

Chapter 62-213, F.A.C. www.dep.state.fl.us/air/rules/fac/62-213.pdf

- Because the facility is a Title V source, the applicant will be required to apply for and obtain a Title V operation permit in the future.

Chapter 62-296, F.A.C. www.dep.state.fl.us/air/rules/fac/62-296.pdf

Rule 62-296.320, F.A.C., General Pollutant Emission Limitation Standards.

- This rule prohibits the discharge of air pollutants which cause or contribute to an objectionable odor;
- This rule specifies a visible emissions standard of 20 percent (%) opacity; and
- The rule prohibits emissions of unconfined PM provisions without taking reasonable precautions to prevent such emissions.

Rules 62-296.401, F.A.C., Incinerators and Rule 62-296.416, F.A.C., Waste-to-Energy Facilities.

- Incinerators and waste to energy facilities combust waste. The fuel slate authorized by this permit does constitute a waste or MSW according to the Department's rules. Therefore, these two rules do apply to this project.

Rule 62-296.406, F.A.C., Fossil Fuel Steam Generators with Less than 250 mmBtu Heat Input

- The fossil fuel capability of the auxiliary boiler will be less than 250 mmBtu/hr heat input. This rule applies only to the extent that fossil fuel is burned in the auxiliary boiler. This provision includes: a visible emissions standard of 20% opacity and a requirement to conduct a determination of best available control technology (BACT) for PM and SO_2 for fossil fuel combustion.

403.061, F.S. 403.061, F.S.

- According to this particular statute, the department shall have the power and the duty to control and prohibit pollution of air and water in accordance with the law and rules adopted and promulgated by it and, for this purpose, to: (18) encourage and conduct studies, investigations, and research relating to pollution and its causes, effects, prevention, abatement, and control.
- This particular project presents a novel approach and configuration for the processing of MSW, recovery of energy there from, and control of air pollutants including plasma arc gasification, combustion in a TO and use of SCR.

5. DEPARTMENT EVALUATION

The syngas-fueled TO and associated equipment constitutes the MWC regulated pursuant to 40 CFR 60, Subpart Eb. The concentration-based emission limits pursuant to Subpart Eb are provided in Table 4 for comparison with those proposed by the applicant. Additional details are provided in the subsequent sections.

Table 4 - Comparison of Concentration-based Emission Limits from Geoplasma Project with Requirements for MWC's per Subpart Eb

Pollutant	Subpart Eb	Geoplasma
NO_X	180 ppmvd [1] (1st year) 150 (thereafter) (24 hr mean)	150 ppmvd (24 hr mean) 7.6 lb/hr (12-month mean) ~13.9 ppmvd (12-month mean) [2]
CO	No specific limit for MWC burning gasified waste	50 ppmvd (24-hr block mean) 7.6 lb/hr (12-month mean) ~22.8 ppmvd (12-month mean)
SO_2	30 ppmvd or 80% control [3] (24-hr geometric mean)	30 ppmvd or 80% control (24-hr geometric mean) 3.7 lb/hr (12-month mean) ~4.9 ppmvd (12-month mean)
VOC	N/A [4]	7.6 lb/hour
HCl	25 ppmvd or 95% control [3]	25 ppmvd or 95% control 3.7 lb/hr (12-month mean) ~8.6 ppmvd (12-month mean)
PM	20 mg/dscm [5]	20 mg/dscm 5.7 lb/hr
Pb	140 µg/dscm [6]	140 µg/dscm
Hg	50 µg/dscm or 85% control [3]	3.9 µg/dscm (12 month mean) or 85% control
Cd	10 µg/dscm	10 µg/dscm
D/F	13 ng/dscm [7]	13 ng/dscm
VE	10 % - 6 minute average	N/A
NH_3 Slip	N/A [4]	2 ppmvd

1. ppmvd means parts per million by volume, dry corrected to 7% oxygen (@7% O_2).
2. the '~' symbol means approximate concentration equivalent to corresponding 12-month lb/hr limit.
3. least stringent of the values.
4. VOC and NH_3 emission limit not required by Subpart Eb.
5. mg/dscm means milligrams per dry standard cubic meter (dscm) @7% O_2.
6. µg/dscm means micrograms/dscm @7% O_2.
7. ng/dscm means total nanograms/dscm @7% O_2.

5.1. Emissions and Controls for the TO

NO_X Emissions

NO_X formation: NO_X formation may occur by three different mechanisms: fuel NO_X is formed from nitrogen compounds contained in fuel (fuel nitrogen); thermal NO_X is formed from molecular or atomic nitrogen (N_2) and oxygen (O_2) present in combustion air; and prompt NO_X is formed in the proximity of the flame front as intermediate combustion products.

NO_X control strategy: NO_X will be controlled by the following measures:

- A type of multi-stage TO with reducing, conditioning and oxidizing sections will be used to combust the syngas. Flue gas recirculation (FGR) will be employed in two of the sections to reduce NO_X formation; and
- Combustion exhaust gases will be treated in a SCR system that will convert NO_X and injected NH_3 to molecular nitrogen (N_2) and water vapor (H_2O).

NO_X emission limits: Following are the NO_X emission limits proposed for this project:

- 150 ppmvd on a 24 hour arithmetic average to comply with 40 CFR 60 Subpart Eb; and
- 7.6 lb/hr on a 12-month rolling average, rolled monthly (applicant's request).

For reference, the proposed mass emission rate equates to a long-term value of 13.9 ppmvd @7% O_2. This would be the lowest known emission rate for any MWC in the U.S.

NO_X monitoring: Compliance with the NO_X limits will be monitored through the continuous emission monitoring system (CEMS) specifications for units subject to 40 CFR 60, Appendices A and F.

SO_2 and HCl Emissions

SO_2 and HCl formation: SO_2 and HCl are formed from sulfur and chloride (Cl) compounds contained in MSW, coke and tires.

SO_2 and HCl control strategy:

- Use of limestone in a FGD system to control SO_2 and acid gases including HCl.

A by-product of the FGD system will be gypsum which will be sold to wallboard manufacturers.

SO_2 emission limits: Following are the SO_2 emission limits proposed for this project:

- 30 ppmvd on a 24 hour geometric average or 80% reduction whichever is less stringent to comply with 40 CFR 60 Subpart Eb; and
- 3.7 lb SO_2/hr on a 12-month average, rolled monthly (applicant's request).

For reference, the proposed mass emission rate equates to a long-term value of 4.9 ppmvd @7% O_2.

SO_2 monitoring:

- Compliance with the SO_2 limits will be monitored using the SO_2-CEMS specifications equal to those of units subject to 40 CFR 60, Appendices A and F.

HCl emission limits:

- 25 ppmvd HCl or 95% reduction whichever is less stringent to comply with 40 CFR 60 Subpart Eb; and
- 3.7 lb HCl/hr on a 12-month average, rolled monthly (applicant's request).

For reference, the proposed mass emission rate equates to a long-term value of 8.6 ppmvd HCl.

SO_2 and HCl monitoring:

- Compliance with the HCl limits will be monitored using initial and annual stack tests using EPA Test Methods 26 or 26A.

PM/PM_{10}, Metals and Visible Emissions (VE)

Particulate formation. PM/PM_{10} are formed from ash contained in the MSW, coke, tires and other permitted feedstocks, products of incomplete combustion and from chemical reactions between products of combustion that form alkali and ammoniated chlorides, sulfates, nitrates and other such species. These emissions are also reflected as VE from stacks or contribute to regional haze due to further reactions in the atmosphere. Metals refer to Pb and Cd that are constituents of PM/PM_{10} and are specifically limited by 40 CFR 60, Subpart Eb.

Particulate control strategy:

- Low NO_X and SO_2 emissions to minimize formation of fine particulate species;
- Use of an ESP;
- SCR to minimize the amount of NH_3 injection (needed to reduce NO_X) and NH_3 slip that would otherwise participate in fine particle formation; and
- Use of a fabric filter baghouse.

Particulate and VE limits: Following are the particulate emissions limit proposed for this project:

- 20 mg/dscm of PM/PM_{10} to comply with 40 CFR 60 Subpart Eb;
- 10 and 140 µg/dscm respectively of Cd and Pb to comply with 40 CFR 60 Subpart Eb;
- 5.7 lb/hr of PM/PM_{10} (applicant's request);
- A baghouse design of 0.01 grains per dry standard cubic foot (gr/dscf) or better;
- NH_3 limit of 2 ppmvd at 7% O_2; and
- A VE limit of 10% (6-minute average) that will satisfy the minimum VE standard of 20% opacity per Rules 62-296.320 and 62-296.406, F.A.C.

Particulate and VE monitoring:

- Initial and annual particulate testing using EPA Methods 5 and 202;
- Initial and annual tests for Cd and Pb by EPA Method 29;
- Initial and annual VE tests by EPA Method 9 and measurements by a continuous opacity monitoring system (COMS); and
- Initial and annual NH_3 testing using EPA Method 320.

Hg Emissions

Hg sources and release: Hg is volatilized and released during combustion. The primary sources of mercury in MSW include batteries, thermostats, thermometers, switches and lamps.

Hg control strategy: A key component of the Hg control strategy is to continue present programs practiced at the SLCBRF. The main process strategy is the PACI system in conjunction with the fabric filter baghouse.

Hg limit: Following are the proposed Hg limits:

- 50 µg/dscm to comply with 40 CFR 60 Subpart Eb; and either
- 3.9 µg/dscm (applicant's request); or
- 85% removal whichever is less stringent.

The Department will apply a 12-month averaging time to the lower concentration limit.

Hg monitoring:

- Initial and annual test for Hg by EPA Method 29 to demonstrate compliance with the higher Subpart Eb limit; and
- Compliance with the lower 12-month Hg concentration limit will be monitored using a Hg-CEMS as described in 40 CFR 60, Subpart Eb (Section 60.58(n).

Dioxin/furan (D/F) emissions

D/F formation: The gasification of MSW provides the opportunity to form ringed hydrocarbon compounds. In the presence of chlorides, the opportunity for D/F formation exists.

D/F control strategy:

- Sufficient residence time in the gasifier;
- Thorough destruction of VOC in the TO;
- PACI system in conjunction with the fabric filter baghouse; and
- Further destruction by the SCR system.

D/F limit:

- 13 ng/dscm of D/F.

D/F Monitoring:

- Initial and annual test for D/F by EPA Method 23 to demonstrate compliance with the Subpart Eb limit.

Sulfuric Acid Mist (SAM) Emissions

SAM formation: SAM is formed by further oxidation of SO_2 to sulfur trioxide (SO_3) prior to exiting the process. SO_3 readily combines with water vapor (H_2O) available in flue gas to form SAM (H_2SO_4). SAM condenses on the cool surfaces in the exhaust duct, air pollution control equipment or on fly ash particles.

SAM control strategy: The SAM control strategy relies on the SO_2, HCl, PM/PM_{10} and VE control strategies.

SAM limits: No limits on SAM are proposed or required.

SAM monitoring: The monitoring of SO_2, condensable PM and visible emissions is sufficient for the purposes of insuring that SAM emissions are actually low. The Department will require an initial stack test to determine the SAM emission characteristics of the TO and control system.

CO and VOC Emissions

CO and VOC formation: CO and VOC are products of incomplete combustion.

CO and VOC control strategy: Following is the CO and VOC emissions control strategy for this project:

- High temperature gasification followed by combustion in a multistage TO; and
- Incorporation of SCR for NO_X control will help to reduce VOC emissions including organic HAP emissions such as dioxin and furan (D/F).

CO emission limits: Following are the CO emission limits proposed for this project:

- 50 ppmvd on a 24 hour block arithmetic average; and
- 7.6 lb/hr on a 12-month rolling average (applicant's request).

For reference there is no stated CO limit in 40 CFR 60 Subpart Eb for a gasification/TO configuration. CO limits for other categories range from 50 to 150 ppmvd and averaging times between 4 and 24 hours. For reference, the proposed mass emission rate equates to a long-term value of 22.8 ppmvd for CO.

VOC emission limits: Following are the VOC emission limits proposed for this project:

- 7.6 lb/hr on a 12-month rolling average (applicant's request).

CO and VOC monitoring:

Compliance with the long-term hourly CO limit will be monitored by CEMS in accordance with Performance Specification 4A of 40 CFR 60, Appendix B. The Department will require an initial stack test to determine the VOC emission characteristics of the unit using total hydrocarbons (THC) as a surrogate.

5.2. *Startup, Shutdown and Malfunctions – Proposed TO*

The standards under 40 CFR 60, Subpart Eb apply at all times except during periods of startup, shutdown or malfunction pursuant to 40 CFR 60.56b. Duration of startup or shutdown periods are limited to 3 hours per occurrence, except as provided in 40 CFR 60.58b(a)(1)(iii). During periods of startup, shutdown, or malfunction, monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported in accordance with the provisions of 40 CFR 60.59b(d)(7).

The startup period commences when the affected facility begins the continuous gasification of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other non-municipal solid waste fuel, and no municipal solid waste is being fed to the combustor.

Continuous gasification is the continuous, semi-continuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production.

Because of the long-term nature of all of the NO_X, SO_2, CO and Hg CEMS based mass emission rate limits and to avoid triggering PSD, all emissions data for these pollutants, including periods of startup, shutdown and malfunction, shall be included in any compliance determinations based on CEMS data.

5.3. Emissions and Controls for the Support Equipment

Emergency Generator

The emergency generator will be used 500 hours or less per year. Table 5 provides the emission limits pursuant to 40 CFR 60, Subpart IIII. Compliance with this standard also satisfies the requirements of 40 CFR 63, Subpart ZZZZ.

Table 5 - NSPS Subpart IIII – Standards Applicable to Emergency Generator

Capacity Category (2007 and later)	**CO** (g/kW-hr)[1]	**PM** (g/kW-hr)	**SO_2**[2] **(% S)**	**NMHC**[3]**+NO_X** (g/kW-hr)
(130 ≤ kW ≤ 560 kW)	2.6	0.15	0.0015	3.0

1. g/kW-hr means grams per kilowatt-hour.
2. SO_2 emission standard will be met by using ULSD fuel oil in the emergency generator and the wood chipper with fuel sulfur (S) content of 0.0015% by weight.
3. NMHC means Non-Methane Hydrocarbons.

Emergency Fire Pump Engine

The emergency fire pump engine will be used 500 hours or less per year. Table 6 is a summary of the emission limits pursuant to 40 CFR 60, Subpart IIII for the category that covers the fire pump engine.

Table 6 - NSPS Subpart IIII – Emission Standards Applicable to the Emergency Pumps

Emergency Pumps (2009 and later)	**CO** (g/hp-hr)[1]	**PM** (g/hp-hr)	**SO_2**[2] **(% S)**	**NMHC+NO_X** (g/hp-hr)
(300 ≤ HP < 600)	2.6	0.15	0.0015	3.0

1. g/hp-hr means grams per horsepower-hour.
2. SO_2 emission standard will be met by using ULSD FO in the emergency pumps with a fuel sulfur content of 0.0015% by weight.

Auxiliary Boiler

One natural gas fired auxiliary boiler is required to provide steam in the event the plasma arc gasifier is not in operation. The specifications of the auxiliary boiler are:

- The maximum heat input rate to the auxiliary boiler is restricted to no more than 216 mmBtu/hr on a 4-hour average basis;
- The auxiliary boiler shall fire only natural gas with a maximum fuel sulfur content of 20 grains per 100 standard cubic foot;
- The hours of operation of the auxiliary boiler are restricted to no more than 1,314 hours in any consecutive 12 month period at its maximum firing rate; and
- If the auxiliary boiler is fired at less than the permitted capacity, the operational hours shall be prorated based on the firing rate, e.g., at 50% capacity every hour of "actual" operation equals 30 minutes of permitted operation.

The auxiliary boiler is subject to the small boiler BACT requirements of Rule 62-296.406, F.A.C., which includes a determination of the Best Available Control Technology (BACT) for PM and SO_2 emissions. For this project, BACT for PM and SO_2 emissions is determined to be the firing of clean natural gas as the only authorized fuel. In addition, the auxiliary boiler is subject to all applicable requirements of 40 CFR 60, Subpart Db which applies to Small Industrial, Commercial or Institutional Boilers.

NO_X and Opacity emission limits: The auxiliary boiler shall meet the following emissions limits:

- NO_X Emissions: NO_X emissions shall not exceed 0.20 pounds per mmBtu; and
- Opacity: VE shall not exceed 20% opacity except for one 6-minute period per hour that shall not exceed 27% opacity.

NO_X and Opacity monitoring:

In accordance with EPA Method 7E, the auxiliary boiler stack shall be tested to demonstrate initial compliance with the NO_X emissions standard. Subsequently, compliance on a thirty day rolling average basis shall be shown utilizing a NO_X CEMS. In accordance with EPA Method 9, the auxiliary boiler stack shall be tested initially and annual to demonstrate compliance with the VE standard.

6. AMBIENT AIR QUALITY

6.1. Introduction

The proposed project maximum emission rates are well below PSD threshold levels, therefore an ambient air quality modeling analysis was not required for this project. However, the applicant provided an ambient air quality analysis to show compliance with the Ambient Air Quality Standards (AAQS). The following sections include the AAQS analysis, a review of current air quality in the vicinity of the project and information regarding this project and how it relates to other nearby sources of pollution.

6.2. Major Stationary Sources Near the Proposed Geoplasma Site

The proposed project is in St. Lucie County. Tables 7 to 11 below are lists of the largest stationary sources, by pollutant, in St. Lucie County and includes some larger sources in neighboring Martin County. The information is from annual operating reports submitted by the operators to the Department for 2009. Some data is from 2008 (noted below) due to incomplete data from 2009.

Table 7 - Largest Sources of NO_X (2009)

Owner	Site Name, County	TPY
Florida Power & Light (FPL)	FPL Martin Power Plant (2008), Martin County	4,688
Indiantown Cogeneration	Indiantown Cogeneration, Martin County	1,301
Florida Gas Transmission (FGT) Co.	FGT Station 20, St. Lucie County (SLC)	289
St. Lucie Plasma Gasification	**Plasma Gasification Facility (Proposed), SLC**	**50**
Tropicana Manufacturing	Tropicana Ft. Pierce, SLC	34
Florida Municipal Power Agency (FMPA)	Treasure Coast Energy Center, SLC	33
Florida Power and Light	St. Lucie Nuclear Power Plant, SLC	32
Ft. Pierce HD King Power Plant	HD King Power Plant (2008), SLC	28

Table 8 - Largest Sources of SO_2 (2009)

Owner	Site Name, County	TPY
FPL	FPL Martin Power Plant (2008), Martin County	7,734
Indiantown Cogeneration	Indiantown Cogeneration, Martin County	1,767
St. Lucie Plasma Gasification	**Plasma Gasification Facility (Proposed), SLC**	**18**
Ranger Construction Industries	Ranger Ft. Pierce, SLC	7
Dickerson Florida	Dickerson Asphalt Plant 14, SLC	6
FMPA	Treasure Coast Energy Center, SLC	4

Table 9 - Largest Sources of PM/PM_{10} (2009)

Owner	Site Name, County	TPY
FPL	FPL Martin Power Plant (2008), Martin County	844
FMPA	Treasure Coast Energy Center, SLC	40
St. Lucie Plasma Gasification	**Plasma Gasification Facility (Proposed), SLC**	**38**
Tropicana Manufacturing	Tropicana Ft. Pierce, SLC	12
FGT	FGT Station 20, SLC	5
Dickerson Florida	Dickerson Asphalt Plant 14, SLC	5

Table 10 - Largest Sources of CO (2009)

Owner	Site Name, County	TPY
FPL	FPL Martin Power Plant (2008), Martin County	1,451
Louis Dreyfus Citrus	Indiantown Plant, Martin County	776
Tropicana Manufacturing	Tropicana Ft. Pierce, SLC	144
Indiantown Cogeneration	Indiantown Cogeneration, Martin County	123
FGT	FGT Station 20, SLC	73
St. Lucie Plasma Gasification	**Plasma Gasification Facility (Proposed), SLC**	**46**
Ranger Construction Industries	Ranger Ft. Pierce, SLC	15
Dickerson Florida	Dickerson Asphalt Plant 14, SLC	13

Table 11 - Largest Sources of VOC (2009)

Owner	Site Name	TPY
Louis Dreyfus Citrus	Indiantown Plant, SLC	768
Tropicana Manufacturing	Tropicana Ft. Pierce, SLC	582
FPL	FPL Martin Power Plant (2008), Martin County	196
FGT	FGT Station 20, SLC	50
S2 Yachts	S2 Yachts, SLC	38
St. Lucie Plasma Gasification	**Plasma Gasification Facility (Proposed), SLC**	**34**
Maverick Boat Company	Maverick Boat Company, SLC	14

6.3. Ambient Air Monitoring Network

The State ambient air monitoring network operated by the Department and its partners (local air pollution control programs) includes monitors in counties containing over 90% of the population. As Figure 12 indicates, the ambient air monitoring sites are concentrated in areas of high population density, along the coasts and near major highways in the interior portion of the state.

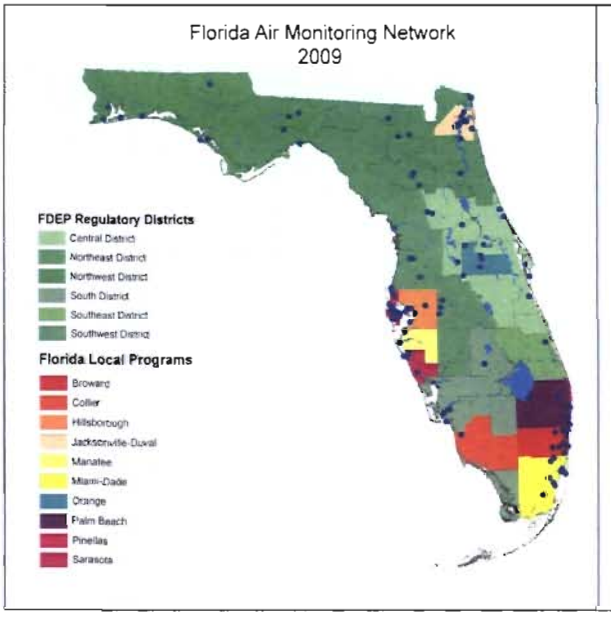

Figure 12 – Florida Air Monitoring Network 2009

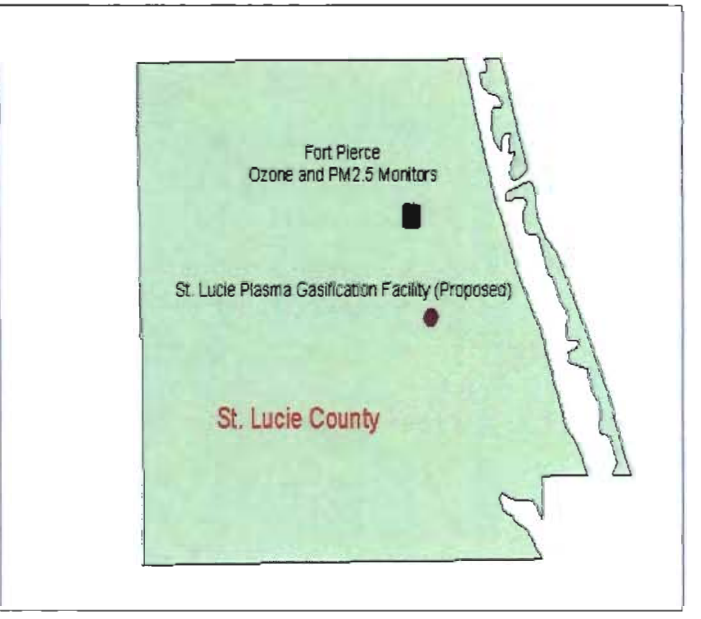

Figure 13. Monitors in St. Lucie County

The Department operates a monitoring site in Ft. Pierce, St. Lucie County for the measurement of ozone and $PM_{2.5}$ as shown in Figure 13 above and Table 12.

Table 12 – Description of Ambient Monitoring Site in Fort Pierce, St. Lucie County

Station	Parameter	Frequency	Designation	Status
Ft. Pierce, 101 North Rock Road	Ozone	Continuous	SLAMS	Regulatory
	$PM_{2.5}$	Every 3 days	SLAMS	Primary Regulatory
	$PM_{2.5}$	Every 12 days	Collocated	Backup to regulatory
	$PM_{2.5}$	Continuous	SPM	Non-regulatory

1. SLAMS means State and Local Air Monitoring Stations used for regulatory AAQS attainment determinations
2. Data from a collocated sampler, if available, can be substituted for the primary sampler if the primary sampler was not operating or did not produce a valid measurement for that same day
3. SPM means Special Purpose Monitors and are not used for regulatory determinations

6.4. Existing Ambient Air Quality – $PM_{2.5}$ and Ozone

Ozone is a key indicator of the overall state of regional air quality. It is not emitted directly from combustion processes. Rather it is formed from VOC and NO_X emitted primarily from regional industrial and transportation sources. VOC is also emitted from fires and vegetation (e.g. isoprene). These two precursors participate in photochemical reactions that occur on an area-wide basis and are highly dependent on meteorological factors.

Ozone limits and measurements are summarized on three year blocks, rolled annually. The reported ozone value was calculated by taking the maximum 8-hour readings recorded each day during the three years. The fourth highest of the recorded maxima were identified for each year and then the average of those three values was reported as the compliance value.

The St. Lucie County ozone compliance value is 63 parts per billion (ppb). It is shown in Figure 14 below, which shows the highest compliance values measured in each county where at least one ozone station is located.

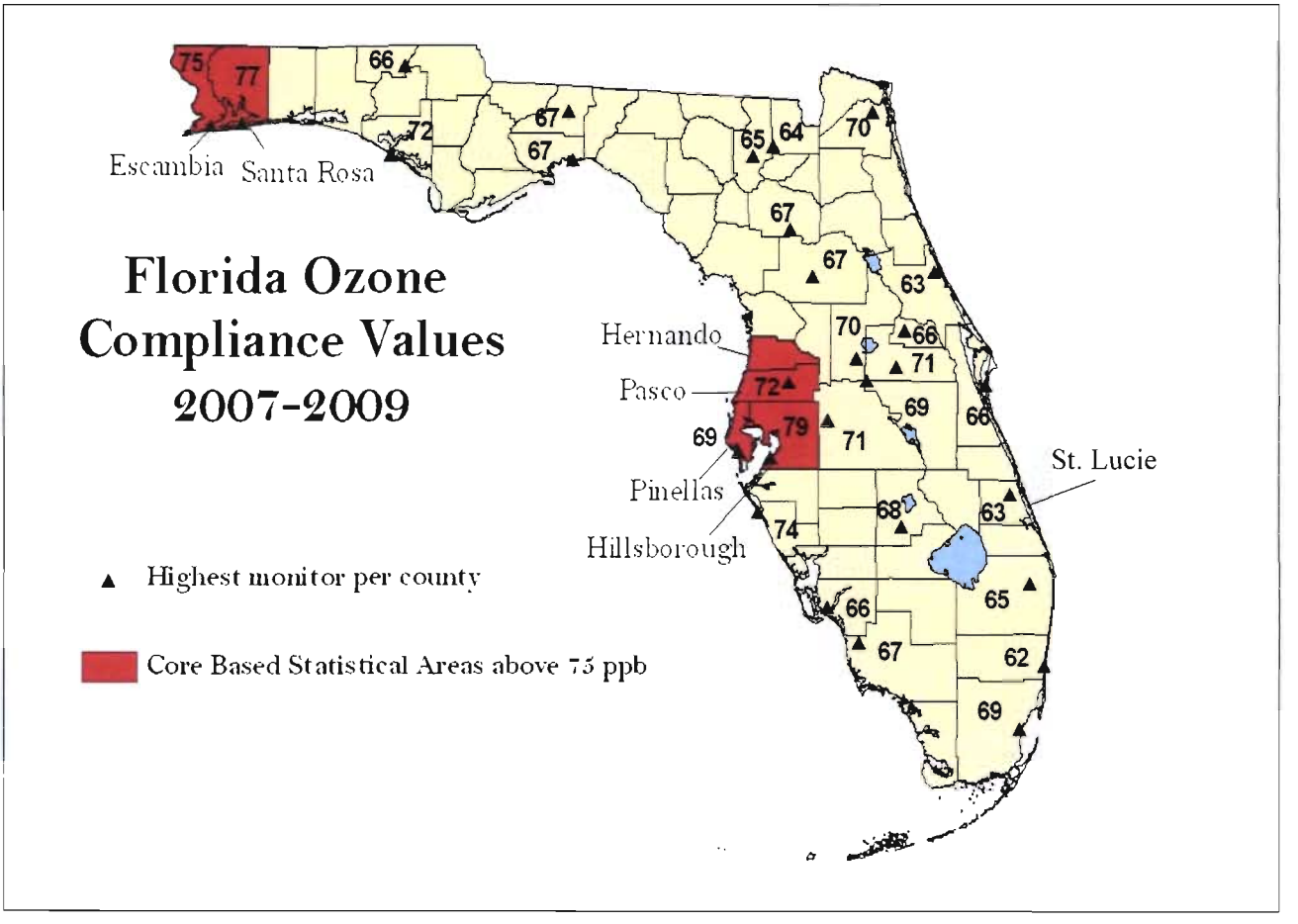

Figure 14 – Florida Ozone Compliance Values

$PM_{2.5}$ (also known as PM_{fine}) is another key indicator of the overall state of regional air quality. Some $PM_{2.5}$ is directly emitted as a product of combustion from transportation and industrial sources as well as fires. Much of it consists of particulate nitrates and sulfates formed through chemical reactions between gaseous precursors such as SO_2 and NO_X from combustion sources and ammonia (NH_3) naturally present in the air or added by other industrial sources.

$PM_{2.5}$ limits and measurements are summarized on three year blocks, rolled annually. The reported 24-hour compliance value for $PM_{2.5}$ of 18 $\mu g/m^3$ shown in Figure 15 for the Ft. Pierce site was calculated by taking the average 24-hour readings recorded each day during the three years (2007-2009). The value for each year that exceeds 98% of all daily measurements within each given year was identified and then the average of those three numbers was reported as the 24-hour compliance value and compared with the standard of 35 $\mu g/m^3$.

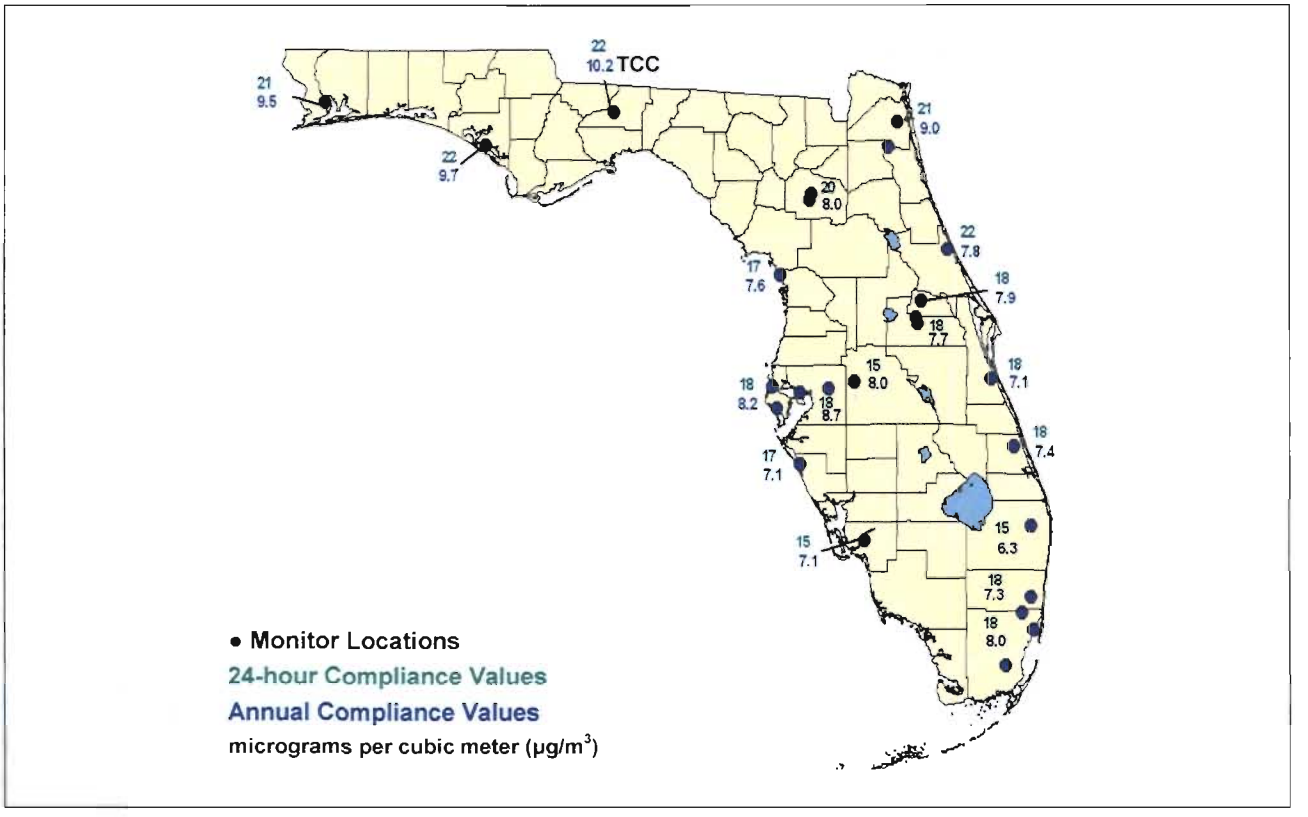

Figure 15 – Florida $PM_{2.5}$ Compliance Values

The simple average of all $PM_{2.5}$ measurements within each three years (2007-2009) was also calculated and then the mean of the three averages (7.4 $\mu g/m^3$) was reported as the annual compliance value and compared with the standard of 15 $\mu g/m^3$.

The results indicate that St. Lucie County is in attainment with the applicable ozone and $PM_{2.5}$ AAQS.

6.5. Ambient Air Monitoring – NO_2, SO_2, PM_{10} and CO

Nitrogen dioxide (NO_2), SO_2, CO and PM_{10} are directly emitted or quickly formed from combustion sources. PM_{10} is also generated from material processing operations and entrained by wind, traffic, farming and other human activities. These criteria pollutants are monitored near areas of large stationary sources, large population centers or high traffic areas where both emissions and monitored concentrations of pollutants would generally be highest.

There are no active monitors for these four pollutants in St. Lucie County. None are required by federal and state procedures for siting National Ambient Monitoring Stations (NAMS) or SLAMS. Table 13 includes concentrations from key ozone and $PM_{2.5}$ monitors in St. Lucie County as well as values from PM_{10}, CO, NO_2 and SO_2 monitors located in counties where there is an expectation of equal or greater concentrations compared with what would be likely in St. Lucie County.

The measurements of SO_2, NO_2 and CO are one or more orders of magnitude less than the respective AAQS. There are greater transportation and industrial emissions in the areas where the stations are located (e.g. residual oil fueled power plant in Riviera Beach and the sugar industry in Palm Beach County). Values of the same pollutants should be lower in St. Lucie County, and certainly within the respective standards.

Table 13 - Ambient Air Quality Measurements Nearest to the Project Site (2009)

Pollutant	Location	Averaging Period	Ambient Concentration			
			Compliance Period	Value	Standard	Units [g]
Ozone	Ft. Pierce	8-hour	2007-2009	63 [a]	75 [a]	ppb
$PM_{2.5}$	Ft. Pierce	24-hour	2007-2009	18 [b]	35 [b]	$\mu g/m^3$
		Annual	2007-2009	7.4 [c]	15 [c]	$\mu g/m^3$
PM_{10}	Delray Beach, Palm Beach County	24-hour	2007-2009	59 [d]	150 [d]	$\mu g/m^3$
		Annual	2009	17 [e]	50 [e]	$\mu g/m^3$
SO_2	Riviera Beach, Palm Beach County	3-hour	2009	13	1300 [f]	$\mu g/m^3$
		24-hour	2009	8	260 [f]	$\mu g/m^3$
		Annual	2009	4	60 [f]	$\mu g/m^3$
NO_2	Lantana, Palm Beach County	Annual	2009	10	100 [f]	$\mu g/m^3$
CO	Ft. Lauderdale	1-hour	2009	3,565	40,000 [f]	$\mu g/m^3$
		8-hour	2009	2,300	10,000 [f]	$\mu g/m^3$

a. Three year average of the 4th highest daily maximum.
b. Three year average of the 98th percentile of 24-hour concentrations.
c. Three year average of the weighted annual mean.
d. Not to be exceeded on more than an average of one day per year over a three-year period.
e. Arithmetic mean.
f. Not to be exceeded more than once per year.
g. Units are in: micrograms per cubic meter (ug/m3) or parts per billion (ppb).

6.6. Air Quality Impact Analysis

Models and Meteorological Data Used in the Air Quality Analysis

The AERMOD modeling system was used to evaluate the pollutant emissions from the proposed project. AERMOD was approved by the EPA in November 2005. The AERMOD modeling system incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including the treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD contains two input data processors, AERMET and AERMAP. AERMAP is the terrain processor and AERMET is the meteorological data processor. The applicant uses the proposed project's emissions at worst load conditions as inputs to AERMOD.

A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfied the good engineering practice (GEP) stack height criteria.

The AERMET meteorological data used for this analysis consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service at West Palm Beach International Airport and Florida International University (FIU) in Miami, respectively. The 5-year period of meteorological data was from 2001 through 2005.

In reviewing this permit application, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification should EPA revise the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators.

For the NAAQS analysis, a combination of fence line receptors and receptors beyond the fence line were chosen for predicting maximum concentrations in the vicinity of the project out to 4 kilometers (km). The receptor grid consisted of receptors spaced at 50-meter (m) intervals around the facility fence line. Beyond the fence line, receptors were spaced at 100 m out to 2km and 200m spacing from 2 to 4 km.

The applicant provided a modeling analysis to ensure compliance with the national AAQS. The applicant also prepared a Significant Impact Analysis for the proposed project. If the proposed project has modeled concentrations above the Significant Impact Levels, then a multi-source modeling analysis must be done to ensure compliance with the national AAQS. The maximum predicted annual and maximum predicted high, second high short term average for the Significant Impact Analysis are summarized in Table 14 below. As shown in this table, emissions from the proposed facility are below the Significant Impact Levels and therefore, are not expected to significantly cause or contribute to a violation of an AAQS.

Table 14 - Maximum Predicted Air Quality Impacts from Geoplasma Project

Pollutant	Averaging Time	Max Predicted Impact ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	2009 Baseline Concentrations ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Ambient Air Standards ($\mu g/m^3$)
PM_{10}	Annual	0.2	1	17	17	50
	24-Hour	2	5	59	61	150
SO_2	Annual	0.2	1	4	4	80
	24-Hour	1.3	5	8	9	365
	3-hour	2.6	25	13	16	1300
NO_2	Annual	0.2	1	10	10	100
CO	1-hour	6.5	2,000	3,265	3,272	40,000
	8-hour	3.9	500	2,300	2,304	10,000

The applicant also evaluated maximum predicted $PM_{2.5}$ impacts. All PM_{10} emissions were assumed to be $PM_{2.5}$ emissions, which is a conservative assumption. The maximum predicted PM_{10} impacts shown in the previous table were added to the measured $PM_{2.5}$ background concentrations from St. Lucie County. The total impacts are shown in the Table 15 below. The table shows these impacts are less than the national AAQS.

Table 15 – Maximum Predicted $PM_{2.5}$ Impacts from the Geoplasma Project

Pollutant	Averaging Time	Max Predicted Impact ($\mu g/m^3$)	2009 Baseline Concentrations ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Ambient Air Standards ($\mu g/m^3$)
$PM_{2.5}$	Annual	0.2	7.4	7.6	15
	24-Hour	2	18	20	35

The EPA established a new one hour standard for NO_2. The new standard of 189 $\mu g/m^3$ calculated as the 3-year average of the 98th percentile of the daily maximum one-hour average concentrations became effective on April 12, 2010. The applicant did not model NO_2 on an hourly basis. However, the applicant modeled CO on an hourly basis as shown above and calculated an impact of 6.5 $\mu g/m^3$ of CO.

Because the CO and NO_X emission rates for the project are approximately equal, it is reasonable to assume that the project NO_2 impact will also be 6.5 $\mu g/m^3$. If short-term NO_X emissions were actually an order of magnitude greater than CO emission, then the impact on ambient NO_2 would be on the order of 65 $\mu g/m^3$.

The Department reviewed the most recent NO_2 data measured at the most representative site. The data are summarized in the Table 16 below.

Table 16 – Ambient NO_2 Air Quality Measurements at West Palm Beach Lantana Station

Pollutant	Location	Averaging Period	Ambient Concentration ($\mu g/m^3$)	
			Year	2nd Highest Value
NO_2	West Palm Beach, Lantana	1-hour	2009	83
			2008	87
	Average of two years	1-hour	2008-2009	85

By adding the estimated project impact of 6.5 $\mu g\ NO_2/m^3$ to the background value of 85 $\mu g\ NO_2/m^3$, the total is approximately 92 and is less than the value of the new standard. If the NO_2 impact is actually 65 $\mu g\ NO_2/m^3$ then the total including background would be approximately 150 $\mu g/m^3$ and also still less than the value of the new standard.

The applicant also provided a conservative modeling analysis which compared maximum predicted PM_{10}, SO_2 and NO_2 values with the Significant Impact Levels for the Class I areas (e.g. Everglades National Park). The applicant used the same modeling methods for this analysis but placed receptors 50 km away from the facility since all Class I areas in Florida are beyond 50 km from the facility. The results of the analysis are shown in Table 17 below. At 50 km away from the facility, the modeled impacts are well below the Class I Significant Impact Levels.

Table 17 - Maximum Predicted Air Quality Impacts from the Geoplasma Project at 50 km Distance

Pollutant	Averaging Time	Max Predicted Impact ($\mu g/m^3$)	Class I Significant Impact Level ($\mu g/m^3$)
PM_{10}	Annual	0.0002	0.2
	24-Hour	0.007	0.3
SO_2	Annual	0.0002	0.1
	24-Hour	0.004	0.2
	3-hour	0.02	1
NO_2	Annual	0.0002	0.1

7. CONCLUSION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution control regulations as conditioned by the Draft Permit. The project contacts are:

A. A. Linero, P.E. Program Administrator at (850) 921-9523 and alvaro.linero@dep.state.fl.us

David Read, Permit Review at (850) 414-7268 and david.read@dep.state.fl.us

Debbie Nelson, Air Quality Modeling at (850) 294-3870 and deborah.nelson@dep.state.fl.us

DRAFT PERMIT

PERMITTEE

Geoplasma-St. Lucie, LLC
171 17th Street NW, Suite 1550
Atlanta, Georgia 30363

Authorized Representative:
Dr. Hilburn O. Hillestad

Air Permit No. 1110138-001-AC
Expires: June 30, 2014
St. Lucie Plasma Gasification Project
Waste-to-Energy (WTE) Facility
Facility ID No. 1110138
St. Lucie County

PROJECT AND LOCATION

This permit authorizes the construction of a gross 24 megawatt (MW) plasma arc gasification waste-to-energy (WTE) power plant. The proposed Geoplasma-St. Lucie, LLC Plasma Gasification WTE facility will be located in St. Lucie County on a parcel of land approximately 9 acres in size within the site currently occupied by St. Lucie County's Sanitary Landfill. The landfill is located off of Glades Cut-Off Road south of the crossing of Interstate 95 and the Florida Turnpike and approximately 8 miles southwest of the City of Fort Pierce. The UTM coordinates for this site are Zone 17, 335.20 kilometers (km) East and 3,084.10 km North.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C.

CONTENTS

Executed in Tallahassee, Florida

(DRAFT)

Joseph Kahn, Director
Division of Air Resource Management

(Date)

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit with Appendices) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on _____ to the persons listed below.

Hilburn O. Hillestad, Geoplasma-St. Lucie, LLC: hillestad@geoplasma.com
Leonard Shapiro, Energy Resources Group, Inc.: lshapiro@energyresourcesgrp.com
Ron Roberts, St. Lucie County: robertsr@stlucieco.gov
Scott H. Osbourn, P.E., Golder Associates, Inc: sosbourn@golder.com
Doug Neeley, EPA Region 4: neeley.doug@epa.gov
Heather Abrams, EPA Region 4: abrams.heather@epa.gov
Lennon Anderson, SED: lennon.anderson@dep.state.fl.us.
David Mickey, Blue Ridge Environmental Defense League: davidmickey@bellsouth.net
Vickie Gibson, DEP BAR Reading File: victoria.gibson@dep.state.fl.us

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____ _____
(Clerk) (Date)

FACILITY AND PROJECT DESCRIPTION

The proposed facility is a gross 24 MW municipal solid waste (MSW) fed plasma arc gasification power plant called the St. Lucie Plasma Gasification facility. The fuel sources for the plasma arc gasifier will be principally MSW but will also include tires with steel belts and other permitted feedstocks. Metallurgical coke (coke) will also be used to provide a porous bed at the bottom of the gasifier. Limestone will also be added to the gasifier as a flux material to promote the fusion of metals and minerals.

The MSW, tire and other feedstocks will be received, processed for material recovery and size reduction, mixed with limestone and coke, and then fed into the plasma heated gasifier vessel where the organic components of the feedstock materials will be converted into a synthetic fuel gas (syngas). The syngas will then be combusted in a multi-stage thermal oxidizer followed by a heat recovery steam generator (HRSG) to generate high-pressure, high-temperature steam to drive a steam turbine electrical generator (STG) providing electrical power to the grid. The exhaust gas from the HRSG will pass through an emission control system prior to discharge to the atmosphere.

An emergency flaring system will also be available to combust the syngas during times of excess syngas production or the malfunction or shutdown of the thermal oxidizer, HRSG, emission control system or induction draft (ID) fans.

This project creates the following new emissions units (EU).

Facility ID 1110138	
EU ID No.	**Emission Unit Description**
001	Material handling consisting of: fuel feedstock (MSW, tires and coke); limestone; powdered activated carbon (PAC); and, process byproducts (vitrified residue, spent carbon and gypsum)
002	Plasma arc gasifier to generate syngas
003	Emergency syngas flaring system
004	Multi-staged thermal oxidizer fueled by syngas, a HRSG and a STG
005	Emergency generator fueled by biodiesel or ultra low sulfur distillate (ULSD) fuel oil
006	Emergency fire water pump engine fueled by biodiesel or ULSD fuel oil
007	Auxiliary boiler fueled by natural gas

FACILITY REGULATORY CLASSIFICATION

- The facility is a major source of hazardous air pollutants (HAP).
- The facility does not operate units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400 (PSD), F.A.C.
- The facility is not subject to the provisions of the Clean Air Interstate Rule (CAIR), including applicable portions of Chapters 62-204, 62-210 and 62-296, F.A.C.
- The facility is subject to Chapter 62-204.800, F.A.C for New Source Performance Standards (NSPS) under Sections 111 and 129 of the Clean Air Act (CAA) and National Emissions Standards for Hazardous Air Pollutants (NESHAP) under Section 112 of the CAA.

1. Permitting Authority: The permitting authority for this project is the Bureau of Air Regulation, Division of Air Resource Management, Florida Department of Environmental Protection (Department). The Bureau of Air Regulation's mailing address is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. All documents related to applications for permits to operate an emissions unit shall be submitted to the Southeast District (SED) Office of the Department. The SED Office mailing address is 400 North Congress Avenue, Suite 200, West Palm Beach, Florida 33401.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resource Section of the Department's SED Office at 400 North Congress Avenue, Suite 200, West Palm Beach, Florida 33401. The telephone number of the district office is 561/681-6600. Copies of these documents shall also be submitted to the SED Branch Office at 1801 Southeast Hillmoor Drive, Suite C-204, Port St. Lucie, Florida 34652. The telephone number of the branch office is 772/398-2806.

3. Appendices: The following Appendices are attached as part of this permit and must be complied with by the permittee:

a.	Appendix A	Identification of General Provisions - NSPS 40 CFR 60, Subpart A;
b.	Appendix A1	General Provisions - NSPS 40 CFR 63, Subpart A;
c.	Appendix ASTM	ASTM Standard D6751-09 for Biodiesel;
d.	Appendix CC	Common Conditions;
e.	Appendix CEMS	Continuous Emissions Monitoring System (CEMS) Requirements;
f.	Appendix CF	Citation Formats and Glossary of Common Terms;
g.	Appendix CTR	Common Testing Requirements;
h.	Appendix Db	NSPS, 40 CFR 60, Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units;
i.	Appendix Eb	NSPS, 40 CFR 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors;
j.	Appendix GC	General Conditions;
k.	Appendix IIII	NSPS, Subpart IIII - Stationary Compression Ignition Internal Combustion Engines; and,
l.	Appendix ZZZZ	NESHAP, Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines (RICE).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S., and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Source Obligation:

   (a) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   [Rule 62-212.400(12), F.A.C.]

8. Application for Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V air operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V air operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220 and Chapter 62-213, F.A.C.]

9. Objectionable Odors Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

   {Permitting Note: An objectionable odor is defined in Rule 62-210.200(Definitions), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.}

10. Open Burning Prohibited: No person shall ignite, cause to be ignited, or permit to be ignited, any material which will result in any prohibited open burning as regulated by chapter 62-256, F.A.C.; nor shall any person suffer, allow, conduct or maintain any prohibited open burning. [Rule 62-256.300, F.A.C.]

11. Unconfined Emissions of Particulate Matter: No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions. Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter. Reasonable precautions include the following: a) Paving and maintenance of roads, parking areas and yards; b) Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing; c) Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities; d) Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulate from becoming airborne; e) Landscaping or planting of vegetation; f) Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter; g) Confining abrasive blasting where possible; and, h) Enclosure or covering of conveyor systems. In determining what constitutes reasonable precautions for a particular facility, the Department shall consider the cost of the control technique or work practice, the

environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice. [Rule 62-296.320(4)(c), F.A.C.]

12. Excess Emissions: Except as required by specific conditions of this permit dealing with excess emissions with regard to individual emission units, the following conditions apply to excess emissions at the Geoplasma facility.
    a. Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. A malfunction means any unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner.

       {Permitting Note: Per Rules 62-4.070(3) and 62-296(4)(b)1, F.A.C., visible emissions from the emergency flare system shall not exceed 20 percent opacity under any circumstances.}
    b. Malfunction: Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited.
    c. Department Discretion: Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest.
    d. Department Notification: The permittee shall notify the Compliance Authority within one working day of discovering any emissions in excess of a CEMS standard subject to the specified averaging period. All such reasonably preventable emissions shall be included in any CEMS compliance determinations. All valid emissions data (including data collected during startup, shutdown and malfunction) shall be used to report emissions for the Annual Operating Report.

    [Rule 62-210.700, F.A.C.]

    {Permitting Note: The Excess Emissions Rule at Rule 62-210.700, F.A.C., cannot vary or supersede any requirement of an NSPS or NESHAP provision.}
13. Facility-Wide Emissions Report: The owner or operator shall submit an Annual Operating Report (AOR) for Air Pollutant Emitting Facility (DEP Form No. 62-210.900(5)) to the Department annually pursuant to Rule 62-210.370(3), F.A.C. Using the computation methods described in Rule 62-210.370(2), F.A.C., the required AOR shall also include a demonstration that facility emissions of NO_X, CO, SO_2, VOC and PM/PM_{10} are each less than 250 tons per year (TPY). [Rule 62-210.370, F.A.C.]
14. Waste Operating Plan: Thirty days prior to operation of the Geoplasma facility, the permittee must submit an updated solid waste operating plan to the SED waste program. [Rule 62-4.070(3) F.A.C.]
15. Permanent Facility Shut Down: If the Geoplasma facility shuts down permanently, all MSW, tires other permitted feedstock materials and process by-products must be deposed of in the St. Lucie landfill or removed from the site within 7 calendar days. [Rules 62-4.070(3) and 62-296.320(2) F.A.C.]
16. Temporary Facility Shut Down: If the Geoplasma facility is temporarily shut down for more than consecutive 3 days due to malfunction, maintenance or other operational issues, the permittee must remove MSW and other permitted feedstocks to St. Lucie landfill or remove it from the site.
    [Rules 62-4.070(3) and 62-296.320(2) F.A.C.]

A. Material (MSW, Tires, Coke, Limestone, PAC and Process Byproducts) Handling (EU-001)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
001	Material (MSW, Tires, Coke, Limestone, PAC and Process Byproducts) Handling: The following materials will be handled by this emission unit. • *MSW and Tires*: MSW, tires and other permitted feedstocks will be used as fuel for the gasification process. The existing receiving and baling recycling building will be used for initial processing of the fuel with additional storage provided by a building of similar construction. A conveyor system will be utilized to transport fuel from the tipping floor and initial processing areas to the size reduction and storage facilities and from these facilities to the gasifier vessel. Air for the gasifier and thermal oxidizer will be drawn through the waste processing area and conveyor system to minimize the potential for odors and fugitive emissions from these sources. • *Coke:* Coke will be mixed with the MSW/tire fuel to provide a porous bed in the bottom of the gasifier. The coke will be delivered to the project site via trucks and stored in a silo. Coke is projected to be consumed at a rate of approximately 2,000 pounds per hour (lb/hr) and 8,758 tons per year (TPY), which equates to approximately 350 truck deliveries per year. • *Limestone:* Limestone will be used as an additive (flux) in the gasification process and also in flue gas desulfurization (FGD) system for sulfur dioxide (SO_2) control. Limestone will be delivered to the project site via trucks and stored in a silo. Limestone is projected to be consumed at a rate of approximately 3,480 lb/hr in the gasifier (15,234 TPY) and 764 lb/hr (3,346 TPY) in the FGD system. The combined total of approximately 18,580 TPY of limestone will require approximately 743 truck deliveries per year. • *PAC:* PAC will be in the injection system used to control mercury (Hg), trace metals and complex organic compounds. PAC will be delivered to the project site via trucks and stored in a silo. PAC is projected to be consumed at a rate of approximately 38 lb/hr and 167 TPY, which equates to approximately 7 truck deliveries per year. • *Process Byproducts:* The following are the byproducts from the operation of the Geoplasma facility: (1) vitrified (glass like) inorganic residue and residue metals that will be discharged from the bottom of the gasifier into water to produce a coarse sand like aggregate and metal nodules that will be separated, stored as necessary and loaded to trucks for shipment as off-site sales at a rate of 13,200 lb/hr and 57,900 TPY; (2) Spent activated carbon collected in the system bag house that will be transferred via an enclosed conveyor to the spent carbon storage silo (equipped with bin vent fabric filters to minimize any PM emissions) at a rate of approximately 38 lb/hr and 167 TPY; and (3) gypsum produced by the FGD system at a rate of approximately 900 lb/hr and 4,000 TPY.

EQUIPMENT

1. Equipment: The permittee is authorized to construct a material handling system consisting of the following major equipment:
   a. Fuel Conveyor System: A conveyor system to transport the MSW/tires from the existing receiving and baling-recycling building at the St. Lucie County Landfill to the plasma arc gasifier at the collocated Geoplasma facility;
   b. Enclosed Spent Carbon Conveyor System: An enclosed conveyor system to transport the spent activated carbon from the PAC injection system baghouse to the spent carbon storage silo; and,

c. Storage Silos: Four storage silos to store the coke, limestone, PAC and spent carbon that will be utilized or generated at the Geoplasma facility. Each silo shall be pneumatically loaded and equipped with a bin vent fabric filter to minimize PM emissions during the material loading process.

[Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without the air pollution control equipment operating properly.
[Rule 62-210.650, F.A.C.]

PERFORMANCE RESTRICTIONS

3. Approximate Capacities: The material handling emission unit will process up to 686 tons per day (TPD) of MSW and tires for use as fuel in the plasma arc gasifier. Tires as fuel for the gasifier are limited to a maximum rate of 9 percent (%) on a mass basis.
[Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

4. Hours of Operation: The hours of operation of this emission unit are not limited (8,760 hours per year).
[Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

5. Authorized Feedstocks: The primary fuel for the facility is MSW, including the items and materials that fit within the definition of MSW contained in either 40 CFR 60.51b or Section 403.706(5), F.S. Subject to the limitations contained in this permit. The authorized fuels for the facility also include other solid wastes that are not MSW which are described below:

a. Confidential, proprietary or special documents (including but not limited to business records, lottery tickets, event tickets, coupons and microfilm);
b. Contraband which is being destroyed at the request of appropriately authorized local, state or federal governmental agencies, provided that such material is not an explosive, a propellant, a hazardous waste, or otherwise prohibited at the facility. For the purposes of this section, contraband includes but is not limited to drugs, narcotics, fruits, vegetables, plants, counterfeit money, and counterfeit consumer goods;
c. Wood pallets, clean wood, and land clearing debris;
d. Packaging materials and containers;
e. Clothing, natural and synthetic fibers, fabric remnants, and similar debris, including but not limited to aprons and gloves; or
f. Rugs, carpets, and floor coverings, but not asbestos-containing materials or polyethylene or polyurethane vinyl floor coverings.

Subject to the conditions and limitations contained in this permit, the following other solid waste materials may be used as fuel at the facility (i.e. the following are authorized fuels that are non-MSW material). The total quantity of the following non-MSW material received as segregated loads and gasified at the facility shall not exceed 5%, by weight, of the facility's total fuel. Compliance with this limitation shall be determined on a calendar month basis in accordance with **Specific Condition 14** of this subsection.

g. Construction and demolition debris;
h. Oil spill debris from aquatic, coastal, estuarine or river environments, with such items or materials including but are not limited to rags, wipes, and absorbents;
i. Items suitable for human, plant or domesticated animal use, consumption or application where the item's shelf-life has expired or the generator wishes to remove the items from the market, with such items or materials to include but are not limited to off-specification or expired consumer products, pharmaceuticals, medications, health and personal care products, cosmetics, foodstuffs, nutritional supplements, returned goods, and controlled substances; or
j. Consumer-packaged products intended for human or domesticated animal use or application but not

consumption, with such items or materials to include but are not limited to carpet cleaners, household or bathroom cleaners, polishes, waxes and detergents;

k. Waste materials that:
   (i) are generated in the manufacture of items in categories i. or j., and are functionally or commercially useless (expired, rejected or spent); or
   (ii) are not yet formed or packaged for commercial distribution. Such items or materials must be substantially similar to other items or materials routinely found in MSW.

l. Waste materials that contain oil from:
   (i) the routine cleanup of industrial or commercial establishments and machinery; or
   (ii) spills of virgin or used petroleum products. Such items or materials include but are not limited to rags, wipes, and absorbents.

m. Used oil and used oil filters. Used oil containing a polychlorinated biphenyls (PCB) concentration equal or greater than 50 ppm shall not be burned, pursuant to the limitations of 40 CFR 761.20(e); or

n. Waste materials generated by manufacturing, industrial or agricultural activities, provided that these items or materials are substantially similar to items or materials that are found routinely in MSW.

[Rules 62-4.070(1) and 62-4.070(3) F.A.C., and 40 CFR 60.51b.]

6. Prohibited Fuels: The facility shall not gasify:
   a. Those materials that are prohibited by state or federal law;
   b. Those materials that are prohibited by this permit;
   c. Lead acid batteries;
   d. Hazardous waste;
   e. Nuclear waste;
   f. Radioactive waste;
   g. Sewage sludge;
   h. Explosives; and
   i. Beryllium containing waste, as defined in 40 CFR 61, Subpart C.

   Further, the facility shall not knowingly burn:
   j. Nickel-cadmium batteries pursuant to Section 403.7192 (3);
   k. Mercury containing devices and lamps pursuant to Sections 403.7186(2), and (3);
   l. Untreated biomedical waste from biomedical waste generators regulated pursuant to Chapter 64E-16, F.A.C., and from similar generators (or sources);
   m. Segregated loads of biological waste; and
   n. CCA treated wood.

7. Paved Roadways and Gravel Areas: Fugitive dust emissions from the plant's paved roadways and gravel areas shall be controlled in accordance with **Specific Condition 11 of Section 2** of this permit.
   [Rule 62-4.070(3), F.A.C. Reasonable Assurance, and Rule 62-296.320, F.A.C.]

EMISSIONS STANDARDS

8. Opacity: As determined by EPA Method 9, there shall be no visible emissions (VE) greater than 10% opacity, except for one 6 minute period no greater than 20% from the outlets of the silo bin vent fabric filters associated with this emission unit.
   [Rules 62-4.070(3) and 62-297.310(7)(c), F.A.C.]

TESTING AND MONITORING REQUIREMENTS

9. Initial VE Compliance Tests: The outlets of the silo bin vent fabric filter associated with this emissions unit shall be tested to demonstrate initial compliance with the emissions standards for opacity given in **Specific Condition 8** of this subsection. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the emission unit. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

10. Annual VE Compliance Tests: During each federal fiscal year (October 1st to September 30th), the outlets of the silo bin vent fabric filter of this emissions unit shall be tested to demonstrate compliance with the emissions standards for opacity given in **Specific Condition 8** of this subsection. [Rule 62-297.310(7)(a)4, F.A.C.]

11. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

12. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
9	Visual Determination of the Opacity of Emissions from Stationary Sources

The above method is described in Appendix A of 40 CFR 60 which is included as Appendix A of this permit and is adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

RECORDS AND REPORTS

13. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the operating rate. [Rule 62-297.310(8), F.A.C.]

14. Segregated Solid Waste and Tires Record Keeping: The following records shall be made and kept to demonstrate compliance with the segregated non-MSW percentage limitations of **Specific Conditions 3 and 5.** of this subsection:

    a. Each segregated load of non-MSW materials, subject to the percentage weight limitations of **Specific Condition 5** of this subsection, which is received for processing, shall be documented as to waste description and weight. The weight of all waste materials received for processing shall be measured using the facility truck scale and recorded.

    b. Each day the total weight of tires fed to the gasifier subject to the percentage weight limitations of **Specific Condition 3** of this subsection shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of tires shall be divided by the total weight of all waste materials fed to the gasifier in the same calendar month, and the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 9% limitation.

c. Each day the total weight of segregated non-MSW materials fed to the gasifier that are subject to the 5% restriction shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of segregated non-MSW materials subject to the 5% restriction shall be divided by the total weight of all waste materials fed to the gasifier in the same calendar month, and the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 5% limitation.

[Rules 62-4.070(1), 62-4.070(3), and 62-210.200(BACT), F.A.C.]

B. Plasma Arc Gasifier (EU-002)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
002	Plasma Arc Gasifier: The MSW, tires and other authorized feedstocks will be converted in the plasma heated gasifier vessel to a syngas whose primarily energetic components are carbon monoxide (CO) and hydrogen (H_2). Gasification of the proposed feedstocks will occur in an oxygen-limited environment so the feedstock is converted to gas. The syngas from the gasifier is then sent to the multi-staged thermal oxidizer (EU 004) to be combusted and the products of combustion are directed to a HRSG to produce steam for a STG to generate electrical power or sold for process use. In the event of excess syngas production or the unavailability of the thermal oxidizer, HRSG, emission control system or ID fans, the syngas will be flared as described in Section C.

EQUIPMENT

1. Gasifier: The permittee is authorized to construct a gasifier consisting of the following equipment: gasifier vessel, plasma arc electrodes and ancillary equipment.
[Application No.1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

2. Transfer Conveyor Gasifier Feed System: Each MSW processing line, that begins on the tipping floor, will consist of the following major components to feed the plasma arc gasifier, in this sequence:
   a. A variable-speed, flat-to-incline in-feed conveyor (located within the existing trough in the tipping floor);
   b. A Pri-Max or equal quality Primary Reducer (shredder);
   c. An inclined, heavy-duty, slider-pan Discharge Conveyor;
   d. A magnetic ferrous material separator (cross-belt or inline); and
   e. Single troughing-belt transfer conveyor with an integrated weighbridge consisting of one or more sets of troughing idlers that are supported by load cells.
   f. The output from the load cell(s) shall be constantly fed to an electronic integrator, where the conveyor's belt speed is combined with the load cell data to compute a running weight total.

   [Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

3. Gasifier Capacity: The maximum feed rate on a 24 hour block average basis of fuel feedstock to the gasifier is 686 TPD of which approximately 601 TPD will be MSW and other permitted feedstocks, 59 TPD will be tires with steel belts and 26 TPD will be coke. The gasifier mass fuel feed rate shall be measured and recorded by permanently installed equipment as indicated in **Specific Conditions 2.e and 2.f** of this subsection.

   {Permitting Note: On a segregated load, mass basis, tires are limited to 9% and other permitted feedstock to 5% as feedstocks to the gasifier.}

   [Application No. 1110138-001-AC and Rules 62-210.200(PTE) and 62-4.070, F.A.C.]

4. Hours of Operation: The hours of operation of the gasifier are not limited (8,760 hours per year).
[Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

NSPS APPLICABILITY

5. NSPS Subpart Eb and Subpart A Applicability: The gasifier is subject to all applicable requirements of 40 CFR 60, Subpart Eb which applies to Large Municipal Waste Combustors and Subpart A, General Provisions. The applicable conditions are given in Appendices A and Eb of this permit.
[Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Eb and 40 CFR 60 Subpart A]

C. Emergency Syngas Flaring System (EU-003)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
003	Emergency Syngas Flaring System: In the event of a sudden increase in the production of syngas in the gasifier (EU 002) that cannot be accommodated by the multi-staged thermal oxidizer (EU 004) or the sudden unavailability of the thermal oxidizer, HRSG, emission control system or ID fans, it shall be necessary to vent syngas to the emergency flare system. This will be accomplished by means of a flare stack designed to assure combustion of the syngas and safe release of the products of combustion (POC). It is not anticipated that use of the flare system will be required during either normal start up or shutdown of the gasification system or during unplanned shutdowns, as the exhaust gas would continue to be directed through the thermal oxidizer and be subjected to all of the downstream control systems.

EQUIPMENT

1. Equipment: The permittee is authorized to construct one emergency flare system with a continuous pilot and a combustion chamber to destroy unused syngas. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame. [Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

2. Approximate Capacity and Authorized Fuels: The emergency flare system shall be designed to combust syngas at a design heat input rate of 350 million British thermal units per hour (mmBtu/hr) based on a higher heating value (HHV) of the syngas. Natural gas shall be used as fuel for the pilot. The natural gas shall have a maximum fuel sulfur (S) content of 20 grains (gr) per 100 standard cubic feet (scf). [Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

3. Restricted Operation: The hours of operation of the emergency flare system is limited to 10 hours per year (rolling month basis) consisting of up to 20 flaring events of 30 minutes duration or less. The flare systems shall only be used to flare syngas during emergency situations that include excess production of syngas or the sudden unavailability of the thermal oxidizer, HRSG, emission control system or ID fans. [Application No. 1110138-001-AC; Applicant's Request and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

EMISSIONS STANDARDS

4. Visible Emissions (VE) Standard: The flare shall be designed for and operated with VE no greater than 20 percent opacity at all times of operation. [Rules 62-4.070(3) and 62-296(4)(b)1, F.A.C.]

TESTING AND MONITORING REQUIREMENTS

5. VE Compliance Tests: The flare system exhaust shall be tested to demonstrate initial compliance with the VE standard given in **Specific Condition 4** of this subsection no later than 180 days after initial operation and during each federal fiscal year (October 1st to September 30th) thereafter. EPA Method 9 compliance test shall be used to determine the compliance of the flare with the VE requirements. The observation period shall be in accordance with Method 9 requirements. [Rule 62-4.070(3) and 62-296(4)(b)1, F.A.C.]

6. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

7. Test Methods: Any required flare tests shall be performed in accordance with the following methods:

Method	Description of Method and Comments
EPA 9	Visual Determination of the Opacity of Emissions from Stationary Sources

8. Work Practice: Good combustion practices will be utilized at all times to ensure emissions from the flare system are minimized. Therefore, all operators and supervisors shall be properly trained to operate and ensure maintenance of this system in accordance with the guidelines and procedures established by the manufacturer. The training shall include good operating practices as well as methods for minimizing excess emissions. The flare pilot shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of flames. [Rules 62-4.070(3) F.A.C.]

RECORDS AND REPORTS

9. Records: The permittee shall record in a written log the duration of each flare event and the reason for flaring. If requested by the Compliance Authority, the permittee shall provide a copy of these records or a summary of these records. [Rule 62-4.070(3), F.A.C.]

10. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(8), F.A.C.]

D. Multi-Staged Thermal Oxidizer, HRSG and STG (EU-004)

This section of the permit addresses the following emissions units.

ID No.	Emission Unit Description
004	Multi-Staged Thermal Oxidizer, HRSG and STG: • *A Thermal Oxidizer:* To minimize the generation of nitrogen oxides (NO_X) and volatile organic compounds (VOC), the thermal oxidizer will utilize a multistage (reducing/conditioning/oxidizing) combustion process. The reducing chamber includes a hot, turbulent mixing zone to ensure thorough mixing occurs between the incoming syngas and the POC. This feature, coupled with inter-cooling flue gas recirculation, reduces NO_X emissions. To ensure that the syngas has a stable ignition source, the thermal oxidizer will also be supplied with an auxiliary natural gas burner with a heat input capacity of approximately 2 mmBtu/hr. • *HRSG:* The thermal oxidizer exhaust gas stream will be routed to a dedicated HRSG to recover energy by producing steam for generation of electricity and potentially for process uses. Prior to entering the HRSG, the design provides for a conditioning (quench) chamber where the exhaust gas will be conditioned to 1,200 °F, primarily to ensure that the particulate in the off-gas does not foul the HRSG. From the HRSG, the exhaust gas is routed to additional downstream air pollution control equipment and then to a stack (see below). • *STG:* The HRSG will provide high pressure, high temperature steam to a STG. The STG will be a multi-stage extraction, condensing type turbine with steam extraction capability. The STG will also include stop and throttle valves, lube and hydraulic control oil systems including cooling, an exhaust hood spray, a gland seal system including gland steam condenser with exhausters, and turning gear. • *HRSG Stack:* The HRSG stack through which the treated flue gas from the thermal oxidizer will be vented to the atmosphere will have a design height of 125 feet, a design diameter of 5 feet and a flue gas exit temperature of 140 °F at a velocity of 60 feet per second (ft/sec).

EQUIPMENT

1. Construction of Multi-Staged Thermal Oxidizer System: The permittee shall install, operate and maintain a multi-staged thermal oxidizer system consisting of the following equipment: one multi-staged thermal oxidizer with a reducing chamber that includes a hot, turbulent mixing zone coupled with inter-cooling flue gas recirculation and two burners (syngas and natural gas); a HRSG and associated stack; and one gross 24 MW STG. [Application No. 1110138-001-AC and Rule 62-4.070(3), F.A.C.]

2. Air Pollution Control Equipment: To comply with the emission standards of this permit, the permittee shall install the following add-on air pollution control equipment after the multi-staged thermal oxidizer.

   a. Hot Side Electrostatic Precipitator (ESP): The permittee shall install, operate and maintain a hot-side ESP to control particulate matter (PM) and PM with a mean diameter of 10 micrometers (μm) or less (PM_{10}) emissions. The ESP, in combination with the fabric filter baghouse (see below), shall be designed, constructed and operated to achieve the permitted levels of PM/PM_{10} emissions indicated in this subsection.

   b. Selective Catalytic Reduction (SCR) System: The permittee shall install, operate and maintain a SCR system for the Oxidizer/HRSG exhaust stream to control NO_X emissions and further assist in dioxin/furan (D/F) destruction. The SCR system will consist of an ammonia (NH_3) injection grid, catalyst, NH_3 storage, monitoring and control system, electrical, piping and other ancillary equipment. The SCR system shall be designed, constructed and operated to achieve the permitted levels of NO_X emissions indicated in this subsection. The SCR system shall achieve a maximum NH_3 slip level of 2 ppmvd @ 7% oxygen. The SCR system will be located immediately downstream of the ESP.

c. Ammonia Storage: In accordance with 40 CFR 60.130, the storage of NH_3 shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68.

d. PAC Injection System and Fabric Filter Baghouse: The permittee shall install, operate and maintain a PAC injection system and fabric filter baghouse to capture the spent carbon. This system will be designed and implemented for reduction of Hg and as a polishing step for additional control of trace elements not captured by the upstream ESP system. The PAC injection system and baghouse shall be designed, constructed and operated to achieve the permitted levels of Hg and other associated emission limits indicated in this subsection.

e. Flue Gas Desulfurization (FGD) System: The permittee shall install, operate and maintain a FGD system, utilizing limestone as the injection sorbent material to control emissions of acid gases, including SO_2 and hydrogen chloride (HCl). The FGD system shall be designed, constructed and operated to achieve the permitted levels of SO_2 and HCl emissions indicated in this subsection.

f. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. Ammonia, limestone and PAC shall be injected as necessary to ensure compliance with the permitted levels of NO_X, SO_2 and HAP emissions specified in this subsection.

[Application No. 1110138-001-AC and Rules 62-4.070(3) and 62-210.650 F.A.C.]

PERFORMANCE RESTRICTIONS

3. Authorized Fuels: The only authorized fuels for the multi-staged thermal oxidizer are syngas generated in the plasma arc gasifier supplemented by up 2.0 mmBtu/hr of natural gas used by an ignition burner. The natural gas shall have a maximum fuel S content of 20 gr/100 scf.

   [Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

4. Permitted Capacities:

   a. Oxidizer Syngas Burner: The maximum design heat input rate of syngas to the thermal oxidizer is 350 mmBtu/hour on a 4 hour average basis. Heat input rates will vary depending upon the characteristics of the MSW.

   b. Oxidizer Natural Gas Ignition Burner: The design heat input rate of the natural gas burner in the thermal oxidizer is 2.0 mmBtu/hr based on the higher heating value (HHV) of natural gas.

   [Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

{Permitting Note: The estimated HHV for syngas is 6,302 British thermal units per pound (Btu/lb) of MSW on an as received basis and 980 Btu per sc) for natural gas.}

5. Hours of Operation: The hours of operation of the multi-stage thermal oxidizer, HRSG and STG are not limited (8,760 hours per year).

   [Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

NSPS APPLICABILITY

6. NSPS Subpart Eb and Subpart A Applicability: The multi-staged thermal oxidizer system, including HRSG and STG, are subject to all applicable requirements of 40 CFR 60, Subparts A and Eb which applies to Large Municipal Waste Combustors and Subpart A, General Provisions. The applicable conditions are given in Appendices A and Eb of this permit.

   [Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Eb and 40 CFR 60 Subpart A]

EMISSION LIMITS

7. Emission Standards: The following standards are at least as stringent as the Subpart Eb limits described in **Specific Condition 6** of this subsection and in Appendix Eb of this permit. Emissions from the multi-staged thermal oxidizer shall not exceed the following standards.

Pollutant	Basis - Subpart Eb Emission Limit[a]	Basis - PTE[b] Emission Limit
NO_X[c]	150 ppmvd – 24-hour arithmetic average	7.6 lb/hour – 12-month rolling
CO[c]	50 ppmvd – 24-hr block arithmetic average	7.6 lb/hour – 12-month rolling
SO_2[c]	30 ppmvd – 24-hour geometric average or 80% reduction[d]	3.7 lb/hour – 12-month rolling
VOC[e]	N/A[f]	7.6 lb/hour
HCl	25 ppmvd or 95% reduction[d]	3.7 lb/hour
PM/PM_{10}	20.0 mg/dscm	5.7 lb/hour
Lead (Pb)	140 µg/dscm	N/A
Hg[c]	50 µg/dscm or 85% reduction[d]	3.9 µg/dscm – 12-month rolling
Cadmium (Cd)	10 µg/dscm	N/A
D/F[g]	13.0 ng/dscm	3.63×10^{-6} lb/hour
VE[h]	10 % - 6 minute average	N/A
NH_3 Slip	N/A	2 ppmvd

a. NSPS Subpart Eb limits that must be achieved. All concentration values are corrected to 7% oxygen in values of: micrograms per dry standard cubic meter (µg/dscm); milligrams per dry standard cubic meter (mg/dscm); nanograms per dry standard cubic meter (ng/dscm); and parts per million volume dry (ppmvd).
b. Potential to emit (PTE) mass emission rates per applicant's request.
c. After initial emissions compliance stack test for NO_X, CO, SO_2 and Hg, compliance will be CEMS based.
d. Whichever standard is less stringent.
e. Initial and annual VOC stack test to show compliance with limit agreed upon with St. Lucie County.
f. Not applicable.
g. Dioxins/furans: Total tetra through octa-chlorinated dibenzo-p-dioxins and dibenzofurans.
h. Required opacity limit with compliance shown as demonstrated by COMS and EPA Method 9.

[Application No. 1110138-001-AC; Applicant's Request and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

CONTINUOUS EMISSION MONITORS

8. Continuous Monitoring Requirements: The permittee shall install, calibrate, maintain and operate CEMS, a COMS and a diluent monitor to measure and record the emissions of SO_2, NO_X, CO, Hg and VE from the HRSG stack in a manner sufficient to demonstrate continuous compliance with the CEMS-based and COMS-based emission standards given in **Specific Condition 7** of this subsection. A diluent monitor shall be installed to measure and record the emissions of oxygen (O_2) or carbon dioxide (CO_2) in the stack. Each CEMS, COMS and diluent monitor shall be installed, calibrated and properly functioning within 60 calendar days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup and prior to the initial performance tests. Within one working day of discovering emissions in excess of a SO_2, NO_X, CO, Hg or VE standard, the permittee shall notify the Compliance Authority.

a. SO_2 CEMS: The SO_2 CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR 60, Appendices A and F. Recordkeeping and reporting shall be conducted pursuant these appendices. For additional details, including Performance Specifications, see Appendix CEMS of this permit.

b. NO_X CEMS: The NO_X CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR 60, Appendices A and F. Recordkeeping and reporting shall be conducted pursuant to these appendices and Subpart Db in 40 CFR 60. For additional details, including

Performance Specifications, see Appendix CEMS of this permit.

c. CO CEMS: The CO CEMS shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60. The CO monitor span values shall be set appropriately, considering the allowable methods of operation and corresponding emission standards. For additional details see Appendix CEMS of this permit.

d. Hg CEMS: The Hg CEMS shall be certified pursuant to the requirements in Performance Specification 12A (PS-12A), "Specifications and Test Procedures for Total Vapor phase Mercury Continuous Monitoring Systems in Stationary Sources," or that has passed verification tests conducted under the auspices of the U.S. Environmental Protection Agency's (EPA) Environmental Technology Verification (ETV) Program. After certification the owner or operator will begin reporting Hg concentration emissions data. The owner or operator shall adhere to the calibration drift and quarterly performance evaluation procedures and ongoing data quality assurance procedures in 40 CFR Part 60, Appendix F or 40 CFR Part 75, Appendix B. The mass emissions shall be estimated based on the actual data collected no later than 10 days following the end of the month. The mercury monitoring data results shall be submitted quarterly. The CEMS shall only be used as the method of compliance if the owner or operator, at a minimum, meets the requirements of 40 CFR 60.58b(n). Prior to use of the Hg-CEMS as the method to demonstrate compliance, the owner or operator shall submit written notice to the Department, and receive approval for missing data substitution and a data calculation approach plans. For additional details see Appendix CEMS of this permit.

e. COMS: In accordance with 40 CFR 60.48b(a) the permittee shall install, calibrate, operate and maintain a continuous opacity monitor (COM) to continuously monitor and record opacity from the stack. The COMS shall be certified pursuant to 40 CFR 60 Appendix B, Performance Specification 1.

f. Diluent Monitor: The O_2 or CO_2 content of the flue gas shall be monitored at the location where CO and NO_X are monitored. Each monitor shall comply with the performance and quality assurance requirements of 40 CFR 75. For additional details see Appendix CEMS of this permit.

[Application No. 1110138-001-AC; Applicant's Request and Rule 62-4.070(3), F.A.C.]

EXCESS EMISSIONS AND STARTUP, SHUTDOWN AND MALFUNCTION REQUIREMENTS

9. Regulations Pursuant to 40 CFR 60, Subpart Eb: The following conditions apply only to the emissions limits given in **Specific Condition** 7 of this subsection that were specified pursuant to 40 CFR 60, Subpart Eb as incorporated in Rule 62-204.800(8)(b), F.A.C.

a. *The opacity standards:* Opacity standards set forth in 40 CFR 60 shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard. [40 CFR 60.11(c)]

b. *Startup, Shutdown and Malfunction:* Except as provided by 40 CFR 60.56b, the standards under 40 CFR 60, Subpart Eb apply at all times except during periods of startup, shutdown or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence, except as provided in 40 CFR 60.58b(a)(1)(iii). During periods of startup, shutdown, or malfunction, monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported in accordance with the provisions of 40 CFR 60.59b(d)(7).

i. The startup period commences when the affected facility begins the continuous gasification of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other non-municipal solid waste fuel, and no municipal solid waste is being fed to the combustor.

ii. Continuous gasification is the continuous, semi-continuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production.

[40 CFR 60.58b(a)]

10. Mass Based Emission Limits: Because of the long-term nature of all of the NO_X, SO_2, CO and Hg CEMS based mass emission rate limits and to avoid triggering PSD, all emissions data for these pollutants, including periods of startup, shutdown and malfunction, shall be included in any compliance determinations based on CEMS data. [Rules 62-210.700(4), 62-210.200(PTE) and 62-4.070(3), F.A.C.]

TESTING REQUIREMENTS

11. Initial and Annual Compliance Tests: The stack shall be tested to demonstrate initial compliance with the Subpart Eb emissions standards for NO_X, CO, SO_2, HCl, PM/PM_{10}, Pb, Hg, Cd, D/F and VE in addition to the emission standards for VOC and NH_3 slip. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the unit. During each federal fiscal year (October 1st to September 30th), the stack shall be tested to demonstrate compliance with the Subpart Eb emissions standards for NO_X, CO, SO_2, HCl, PM/PM_{10}, Pb, Hg, Cd, D/F and VE in addition to the emission standards for VOC and NH_3 slip. CEMS data for CO, NO_X, SO_2 and Hg along with COMS data for VE shall be reported for each run of the required tests for NO_X, CO, SO_2, VOC, HCl, PM/PM_{10}, Pb, Cd, Hg, D/F, VE and NH_3 slip. Data collected from the reference method during the required RATA tests for the CEMS for CO, NO_X, SO_2 and Hg may be used to satisfy the annual testing requirements provided the notification requirements and emission testing requirements for performance and compliance tests of this permit are satisfied. The Department may require the permittee to repeat some or all of these stack tests after major replacement or major repair of any air pollution control or process equipment. All tests shall be conducted between 90 and 100% of the maximum mass fuel feeding rate to the gasifier.
[Rules 62-212.400(5)(c) and 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]
{Permitting Note: All initial tests must be conducted between 90% and 100% of permitted capacity; otherwise, this permit will be modified to reflect the true maximum capacity as constructed.} [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

12. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

13. Test Methods: Required tests shall be performed in accordance with the following reference methods.

EPA Method	Description of Method and Comments
1 - 4	Determination of Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content. Methods shall be performed as necessary to support other methods.
5	Determination of Particulate Emissions. The minimum sample volume shall be 30 dry standard cubic feet.
6C	Determination of SO_2 Emissions (Instrumental).
7E	Determination of NO_X Emissions (Instrumental). NO_X emissions testing shall be conducted with the air heater operating at the highest heat input possible during the test.
9	Visual Determination of Opacity
10	Measurement of Carbon Monoxide Emissions (Instrumental). The method shall be based on a continuous sampling train.
23	Measurement of Dioxin/Furan Emissions
25A	Gaseous Organic Concentration (Flame Ionization)

26 or 26A	Determination of Hydrogen Chloride Emissions
29	Determination of Metals Emissions from Stationary Sources
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Source This is an EPA conditional test method. The minimum detection limit shall be 1 ppm.

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

OTHER MONITORING REQUIREMENTS

14. Steam Parameters: In accordance with the manufacturer's recommendations, the permittee shall install, calibrate, operate and maintain continuous monitoring and recording devices for the following parameters: steam temperature (°F), steam pressure (psig) and steam production rate (lb/hour). Records shall be maintained on site and made available upon request. [Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

15. Pressure Drop: The permittee shall maintain and calibrate a device which continuously measures and records the pressure drop across each baghouse compartment controlling the PM and PAC emissions downstream from the HRSG. Records shall be maintained on site and made available upon request. [Rule 62-4.070(3), F.A.C.]

16. Bag Leak Detection: The permittee shall maintain continuous operation of bag leak detection systems on the baghouse including keeping records of the systems measurements. Baghouse leak detection records shall be kept on site and made available upon request. [Rule 62-4.070(3), F.A.C.]

17. SCR NH_3 Injection: In accordance with the manufacturer's specifications, the permittee shall install, calibrate, operate and maintain a flow meter to measure and record the NH_3 injection rate for the SCR system. The permittee shall document the general range of NH_3 flow rates required to meet the NO_X standard over the range of load conditions by comparing NO_X emissions with NH_3 flow rates. During NO_X CEMS downtimes or malfunctions, the permittee shall operate at an NH_3 flow rate that is consistent with the documented flow rate for the given load condition. Records shall be maintained on site and made available upon request. [Rule 62-4.070(3), F.A.C.]

18. PAC Injection: In accordance with the manufacturer's specifications, the permittee shall install, calibrate, operate and maintain a mass flow meter to measure and record the PAC injection rate (lb/hour). The permittee shall document the general range of PAC mass flow rates required to meet the Hg standard over the range of load conditions by comparing Hg emissions with PAC mass flow rates. During Hg CEMS downtimes or malfunctions, the permittee shall operate at the PAC mass flow rate that is consistent with the documented flow rate for the given load condition. Records shall be maintained on site and made available upon request. [Rule 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

19. Stack Test Reports: In addition to the information required in Rule 62-297.310(8), F.A.C., each stack test report shall also include the following information: steam production rate (lb/hour), mass fuel input rate to the gasifier (tons/hour), calculated authorized fuels (syngas and natural gas) firing rate in cubic feet per minute and emission rates for NH_3 slip, NO_X, CO, VOC, SO_2, HCl, PM/PM_{10}, Pb, Hg, Cd, D/F and VE in the appropriate units as required in **Specific Condition 7** of this subsection. [Rule 62-4.070(3), F.A.C.]

{Permitting Note: After the initial stack test report, emissions of NO_X, CO, SO_2 and Hg shall be given in subsequent stack test reports based on CEMS data while VE shall be based on COMS data recorded during the stack test for the other pollutants.}

20. Monthly Operations Summary: By the tenth calendar day of each month, the permittee shall record the

following for the thermal oxidizer in a written or electronic log for the previous month of operation: hours of operation; cubic feet of syngas and natural gas; pounds of steam per month; total mass fuel flow into the gasifier; and the updated 12-month rolling totals for each of these operating parameters. The Monthly Operations Summary shall be maintained on site and made available for inspection when requested by the Department. [Rule 62-4.070(3) F.A.C. Reasonable Assurance]

21. Quarterly NO_X, CO, SO_2, Hg and VE Emissions Report: Within 30 days following the end of each quarter, the permittee shall submit a report to the Compliance Authority summarizing CO, NO_X, SO_2 and Hg emissions along with VE including periods of startups, shutdowns, malfunctions, and CEMS and COMS systems monitor availability for the previous quarter. If COMS data is excluded from a compliance determination during the quarter due to a malfunction, the permittee shall include a description of the malfunction, the actual emissions recorded, and the actions taken to correct the malfunction. See Appendix CTR of this permit for the reporting format. [Rules 62-4.070(3), 62-4.130, and 62-210.400(5)(c), F.A.C.]

E. Emergency Generator (EU-005)

This section of the permit addresses the following emissions units.

EU ID No.	Emission Unit Description
005	Emergency Generator: One emergency diesel generator with a maximum design rating of 500 kilowatts (kW)

NSPS AND NESHAP APPLICABILITY

1. NSPS Subpart IIII Applicability: This emergency generator is a Stationary Compression Ignition Internal Combustion Engine (Stationary ICE) and shall comply with applicable provisions of 40 CFR 60, Subpart IIII, including emission testing or certification. [40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines]
2. NESHAPS Subpart ZZZZ Applicability: The emergency generator is a Liquid Fueled Reciprocating Internal Combustion Engines (RICE) and shall comply with applicable provisions of 40 CFR 63, Subpart ZZZZ. Pursuant to 40 CFR 63.6590(c), the generators must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII. [40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)]

EQUIPMENT

3. Emergency Diesel Generator: The permittee is authorized to install, operate, and maintain one emergency generator with a maximum design rating of 500 kW or 671 horsepower (hp) or smaller. [Application No. 1110138-001-AC and Rule 62-210.200 (PTE), F.A.C.]
4. Biodiesel and ULSD FO Storage Tanks: The permittee is authorized to construct up to two 1,000 gallon tanks to store biodiesel and ULSD FO for use in the emergency generator. [Applicant request and 62-4.070(3), Reasonable Assurance]

   {Permitting Note: The biodiesel and ULSD fuel oil storage tanks for the emergency generator at the SLPG facility are not subject to NSPS Subpart Kb because they store liquids with a maximum true vapor pressure less than 3.5 kPa (0.51 pounds per square inch (psi)). Accordingly they are unregulated emissions units per 40 CFR 60.110b(a) and (c) and Rule 62-204.800(7)(b), F.A.C.}

PERFORMANCE RESTRICTIONS

5. Hours of Operation: The emergency generator may operate up to 500 hours per year for maintenance and testing purposes and as necessary when there is a loss of plant power. [Application No. 1110138-001-AC and Rule 62-210.200 (PTE), F.A.C.]
6. Authorized Fuel: The emergency generator shall fire biodiesel or ULSD FO with a S content of less than or equal to 0.0015%. The biodiesel must meet the ASTM specification given in Appendix ASTM of this permit. [Application No. 1110138-001-AC, Applicant's Request and Rule 62-210.200 (PTE), F.A.C.]

EMISSION STANDARDS

7. Emergency Diesel Generator Emissions Limits: The emergency diesel generator shall comply with the following emission limits and demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII the language of which is given in Appendix IIII of this permit. Manufacturer certification when using biodiesel or ULSD FO can be provided to the Department in lieu of actual stack testing.

Emergency Generator (130 ≤ kW ≤ 560 kW)	CO (g/kW-hr)[1]	PM (g/kW-hr)	SO_2[2] (% S)	$NMHC^3+NO_X$ (g/kW-hr)
Subpart IIII (2007 and later)	2.6	0.15	0.0015	3.0

1. g/kW-hr means grams per kilowatt-hour
2. SO_2 emission standard will be met by using biodiesel or ULSD FO with fuel S content of 0.0015% by weight or less.
3. NMHC means Non-Methane Hydrocarbons.

[Application No. 1110138-001-AC and Subpart IIII and Rule 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

8. Notification, Recordkeeping and Reporting Requirements: The permittee shall adhere to the compliance testing and certification requirements listed in 40 CFR 60.4211 and maintain records demonstrating fuel usage and quality. [40 CFR 60.4211]

F. Emergency Fire Water Pump Engine (EU-006)

This section of the permit addresses the following emissions unit.

ID	Emission Unit Description
006	Emergency Fire Pump: One emergency diesel firewater pump engine with a maximum design rating of 335 hp

NSPS AND NESHAP APPLICABILITY

1. NSPS Subpart IIII Applicability: The firewater pump engine is an Emergency Stationary Compression Ignition Internal Combustion Engine (Stationary ICE) and shall comply with applicable provisions of 40 CFR 60, Subpart IIII. [40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines]

2. NESHAP Subpart ZZZZ Applicability: The firewater emergency pump engine is a Liquid Fueled Reciprocating Internal Combustion Engine (RICE) and shall comply with applicable provisions of 40 CFR 63, Subpart ZZZZ. Pursuant to 40 CFR 63.6590(c) the generator must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII.
[40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)]

EQUIPMENT

3. Firewater Pump Engine: The permittee is authorized to install, operate, and maintain one emergency diesel fire pump engine. This unit will have a maximum rating of 335 hp or smaller.
[Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

4. Biodiesel and ULSD FO Storage Tanks: The permittee is authorized to construct up to two 1,000 gallon tanks to store biodiesel and ULSD FO for use in the fire water pump engine.
[Applicant request and 62-4.070(3), Reasonable Assurance]
{Permitting Note: The biodiesel and ULSD FO storage tanks for the fire water pump engine at the SLPG facility are not subject to NSPS Subpart Kb because they store liquids with a maximum true vapor pressure less than 3.5 kPa (0.51psi). Accordingly they are unregulated emissions units per 40 CFR 60.110b(a) and (c) and Rule 62-204.800(7)(b), F.A.C.}

PERFORMANCE RESTRICTIONS

5. Hours of Operation: The firewater emergency pump may operate up to 500 hours per year for maintenance and testing purposes and as necessary to support the plant's fire suppression system.
[Application No. 1110138-001-AC and Rule 62-210.200 (PTE), F.A.C.]

6. Authorized Fuel: This unit shall fire biodiesel or ULSD FO with a S content of less than or equal to 0.0015%. The biodiesel must meet the ASTM specification given in Appendix ASTM of this permit.
[Application No. 1110138-001-AC, Applicant's Request and Rule 62-210.200 (PTE), F.A.C.]

EMISSION STANDARDS

7. Emergency Firewater Pump Emissions Limits: The emergency firewater pump engine shall comply with the following emission limits and demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII. Manufacturer certification may be provided to the Department in lieu of actual testing. [40 CFR 60.4211 and Rule 62-4.070(3), F.A.C.]

Emergency Pumps (300 ≤ HP < 600)	**CO** (g/hp-hr)[1]	**PM** (g/hp-hr)	**SO_2**[2] (% S)	**NMHC+NO_X** (g/hp-hr)
Subpart IIII (2009 and later)	2.6	0.15	0.0015	3.0

1. g/hp-hr means grams per horsepower-hour.
2. SO_2 emission standard will be met by using biodiesel or ULSD FO in the fire pump engine with a fuel S content of 0.0015% by weight or less.

[Application No. 1110138-001-AC; 40 CFR 60, Subpart IIII; and Rule 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

8. Notification, Recordkeeping and Reporting Requirements: The permittee shall adhere to the compliance testing and certification requirements listed in 40 CFR 60.4211 and maintain records demonstrating fuel usage and quality. [Rule 62-212.400 (BACT), F.A.C. and 40 CFR 60.4211]

G. Auxiliary Boiler (EU-007)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
007	Auxiliary Boiler: The auxiliary boiler fires natural gas at a maximum heat input rate of 216 mmBtu/hour, based on the HHV of natural gas. The auxiliary boiler will provide steam in the event the plasma arc gasifier is not in operation. The boiler will be operated for a maximum 1,314 hours per year. Exhaust gases exit a stack with design parameters of 2.75 feet in diameter, 50 feet in height, and at a flow rate of 29,000 acfm with an exit temperature of 296 °F.

EQUIPMENT

1. Auxiliary Boiler: The permittee is authorized to install an auxiliary boiler rated at a maximum of 216 mmBtu/hour of heat input. [Application No. 1110138-001-AC]

PERFORMANCE RESTRICTIONS

2. Authorized Fuel: The auxiliary boiler shall fire only natural gas with a maximum fuel sulfur content of 20 gr/100 scf. [Application No.1110138-001-AC; Applicant's Request and Rule 62-210.200(PTE)]

3. Permitted Capacity: The maximum heat input rate of the auxiliary boiler is 216 mmBtu/hour based on a 4-hour average. [Application No. 1110138-001-AC and Rule 62-210.200(PTE), F.A.C.]

4. Restricted Operation: The auxiliary boiler shall fire only natural gas for no more than 1,314 hours at maximum permitted capacity in any consecutive 12 month period. If the boiler is fired at less than the permitted capacity, the operational hours shall be prorated based on the firing rate, e.g., at 50% capacity every hour of "actual" operation equals 30 minutes of permitted operation.
[Application No. 1110138-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

REGULATORY APPLICABILITY

5. Small Boiler BACT: The auxiliary boiler is subject to the requirements of Rule 62-296.406, F.A.C., which includes a determination of the Best Available Control Technology (BACT) for PM and SO_2 emissions. For this project, BACT for PM and SO_2 emissions is determined to be the firing of clean natural gas as the only authorized fuel. [Rule 62-296.406, F.A.C.]

6. NSPS Subpart Db and Subpart A Applicability: The auxiliary boiler is subject to all applicable requirements of 40 CFR 60, Subpart Db which applies to Small Industrial, Commercial or Institutional Boilers and Subpart A, General Provisions. The applicable conditions are given in Appendices A and Db of this permit. [Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Db and 40 CFR 60 Subpart A]

EMISSIONS STANDARDS

7. NO_X Standard: In accordance with EPA Method 7E, NO_X emissions shall not exceed 0.20 pounds per mmBtu (lb/mmBtu). In accordance with CEMS data, NO_X emissions shall not exceed 0.20 lb/mmBtu on a 30 day rolling average basis. [Application No. 1110138-001-AC; and 40 CFR 60, Subpart Db]

8. Opacity Standard: In accordance with EPA Method 9, VE shall not exceed 20% opacity except for one 6-minute period per hour that shall not exceed 27% opacity.
[Application No. 1110138-001-AC; and 40 CFR 60, Subpart Db]

TESTING AND MONITORING REQUIREMENTS

9. Initial NO_X Compliance Tests: The auxiliary boiler stack shall be tested to demonstrate initial compliance with the NO_X emissions standard given in **Specific Condition 7** of this subsection. The test shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial

operation of the unit. The tests shall be conducted between 90 and 100% of the maximum heat input rate to the auxiliary boiler. [Rules 62-212.400(5)(c) and 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]

10. Initial and Annual VE Compliance Tests: As determined by EPA Method 9, the emissions unit shall be tested to demonstrate initial compliance with the VE standard given in **Specific Condition 8** of this subsection within 60 days after achieving permitted capacity, but no later than 180 days after initial operation of the unit. Thereafter, during each federal fiscal year (October 1st to September 30th), the emissions unit shall be tested in accordance with EPA Method 9 to demonstrate compliance with the VE standard. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

11. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

CONTINUOUS EMISSION MONITORS

12. Continuous Monitoring Requirements: The permittee shall install, calibrate, maintain and operate a CEMS tomeasure and record the emissions of NO_X, from the auxiliary boiler stack in a manner sufficient to demonstrate continuous compliance with the CEMS-based emission standards given in **Specific Condition 7** of this subsection. The CEMS shall be installed, calibrated and properly functioning within 60 calendar days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup and prior to the initial performance tests. Within one working day of discovering emissions in excess of the NO_X standard, the permittee shall notify the Compliance Authority.

    a. NO_X CEMS: The NO_X CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR 60, Appendices A and F. Recordkeeping and reporting shall be conducted pursuant to these appendices and Subpart Db in 40 CFR 60. For additional details, including Performance Specifications, see Appendix CEMS of this permit.

RECORDS AND REPORTS

13. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the heat input rate. [Rule 62-297.310(8), F.A.C.]

CONTENTS

NSPS SUBPART A – GENERAL PROVISIONS

The owner or operator shall comply with all applicable provisions of 40 CFR 60 Subpart A, which is available at the following link:

Link to NSPS Subpart A

NESHAP SUBPART A – GENERAL PROVISIONS

The owner or operator shall comply with all applicable provisions of 40 CFR 63 Subpart A, which is available at the following link:

Link to NESHAP Subpart A

ASTM STANDARD D6751-09 FOR BIODIESEL

ASTM standard for biodiesel is defined as the mono alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, for use in compression-ignition (diesel) engines. This specification is for pure (100%) biodiesel prior to use or blending with diesel fuel.

Standards for Biodiesel	ASTM D-6751	IS 15607 : 2005
Density	Not Mentioned	860 - 900 Kg / m^3
Ester Content	Not Mentioned	96.5 %
Flash point (closed cup)	130°C min. (150°C average)	120°C
Water and sediment	0.050% by vol., max.	500 mg / Kg, max.
Kinematic viscosity at 40°C	1.9-6.0 mm^2/s	2.5-6.0 mm^2/s
Oxidation Stability	Not Mentioned	6 hours min, at 110°C
Ramsbottom carbon residue, % mass	0.10	
Sulfated ash	0.020% by mass, max.	
Sulfur	0.0015% by mass, max*.	50 mg / Kg max
Copper strip corrosion 3 hrs. 50°C	No. 3 max	Class 1
Cetane	47 min.	51 min.
Carbon residue	0.050% by mass, max.	
Acid number, mg KOH/g	0.80 max.	0.50 max.
Methanol or Ethanol	Not Mentioned	0.2 % m/m, max
Free glycerin	0.020 % mass	0.020 % mass
Total glycerine (free glycerine and unconverted glycerides combined)	0.24% by mass, max.	0.25% by mass, max.
Group I Metal (Na+K)	5 mg/Kg, max	5 mg/Kg, max
Group II Metal (Ca+Mg)	Not Mentioned	5 mg/Kg, max
Phosphorus content	0.001 max. % mass	10 mg/Kg, max
Distillation	90% @ 360°C	Not Mentioned

* **S 15 Grade Biodiesel** is required for the Geoplasma Project to meet the fuel sulfur requirements of 40 CFR 60, NSPS Subpart IIII.

Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at the Geoplasma facility.

EMISSIONS AND CONTROLS

1. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]
2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
3. Excess Emissions Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed 2 hours in any 24-hour period unless specifically authorized by the Department for longer duration. Pursuant to Rule 62-210.700(5), F.A.C., the permit subsection may specify more or less stringent requirements for periods of excess emissions. Rule 62-210-700(Excess Emissions), F.A.C., cannot vary or supersede any federal NSPS or NESHAP provision. [Rule 62-210.700(1), F.A.C.]
4. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
5. Excess Emissions - Notification: In case of excess emissions resulting from malfunctions, the permittee shall notify the Compliance Authority in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]
6. VOC or OS Emissions: No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds (VOC) or organic solvents (OS) without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]
7. Objectionable Odor Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and 62-210.200(Definitions), F.A.C.]
8. General Visible Emissions: No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20% opacity. This regulation does not impose a specific testing requirement. [Rule 62-296.320(4)(b)1, F.A.C.]
9. Unconfined Particulate Emissions: No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions. During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

RECORDS AND REPORTS

10. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least 5 years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rule 62-213.440(1)(b)2, F.A.C.]

11. Emissions Computation and Reporting:

    a. *Applicability.* This rule sets forth required methodologies to be used by the owner or operator of a facility for computing actual emissions, baseline actual emissions, and net emissions increase, as defined at Rule 62-210.200, F.A.C., and for computing emissions for purposes of the reporting requirements of subsection 62-210.370(3) and paragraph 62-212.300(1)(e), F.A.C., or of any permit condition that requires emissions be computed in accordance with this rule. This rule is not intended to establish methodologies for determining compliance with the emission limitations of any air permit.

    b. *Computation of Emissions.* For any of the purposes set forth in subsection 62-210.370(1), F.A.C., the owner or operator of a facility shall compute emissions in accordance with the requirements set forth in this subsection.

        (1) Basic Approach. The owner or operator shall employ, on a pollutant-specific basis, the most accurate of the approaches set forth below to compute the emissions of a pollutant from an emissions unit; provided, however, that nothing in this rule shall be construed to require installation and operation of any continuous emissions monitoring system (CEMS), continuous parameter monitoring system (CPMS), or predictive emissions monitoring system (PEMS) not otherwise required by rule or permit, nor shall anything in this rule be construed to require performance of any stack testing not otherwise required by rule or permit.

            (a) If the emissions unit is equipped with a CEMS meeting the requirements of paragraph 62-210.370(2)(b), F.A.C., the owner or operator shall use such CEMS to compute the emissions of the pollutant, unless the owner or operator demonstrates to the department that an alternative approach is more accurate because the CEMS represents still-emerging technology.

            (b) If a CEMS is not available or does not meet the requirements of paragraph 62-210.370(2)(b), F.A.C, but emissions of the pollutant can be computed pursuant to the mass balance methodology of paragraph 62-210.370(2)(c), F.A.C., the owner or operator shall use such methodology, unless the owner or operator demonstrates to the department that an alternative approach is more accurate.

            (c) If a CEMS is not available or does not meet the requirements of paragraph 62-210.370(2)(b), F.A.C., and emissions cannot be computed pursuant to the mass balance methodology, the owner or operator shall use an emission factor meeting the requirements of paragraph 62-210.370(2)(d), F.A.C., unless the owner or operator demonstrates to the department that an alternative approach is more accurate.

        (2) Continuous Emissions Monitoring System (CEMS).

            (a) An owner or operator may use a CEMS to compute emissions of a pollutant for purposes of this rule provided:

                1) The CEMS complies with the applicable certification and quality assurance requirements of 40 CFR Part 60, Appendices B and F, or, for an acid rain unit, the certification and quality assurance requirements of 40 CFR Part 75, all adopted by reference at Rule 62-204.800, F.A.C.; or

2) The owner or operator demonstrates that the CEMS otherwise represents the most accurate means of computing emissions for purposes of this rule.

(b) Stack gas volumetric flow rates used with the CEMS to compute emissions shall be obtained by the most accurate of the following methods as demonstrated by the owner or operator:

1) A calibrated flowmeter that records data on a continuous basis, if available; or

2) The average flow rate of all valid stack tests conducted during a five-year period encompassing the period over which the emissions are being computed, provided all stack tests used shall represent the same operational and physical configuration of the unit.

(c) The owner or operator may use CEMS data in combination with an appropriate f-factor, heat input data, and any other necessary parameters to compute emissions if such method is demonstrated by the owner or operator to be more accurate than using a stack gas volumetric flow rate as set forth at subparagraph 62-210.370(2)(b)2., F.A.C., above.

(3) Mass Balance Calculations.

(a) An owner or operator may use mass balance calculations to compute emissions of a pollutant for purposes of this rule provided the owner or operator:

1) Demonstrates a means of validating the content of the pollutant that is contained in or created by all materials or fuels used in or at the emissions unit; and

2) Assumes that the emissions unit emits all of the pollutant that is contained in or created by any material or fuel used in or at the emissions unit if it cannot otherwise be accounted for in the process or in the capture and destruction of the pollutant by the unit's air pollution control equipment.

(b) Where the vendor of a raw material or fuel which is used in or at the emissions unit publishes a range of pollutant content from such material or fuel, the owner or operator shall use the highest value of the range to compute the emissions, unless the owner or operator demonstrates using site-specific data that another content within the range is more accurate.

(c) In the case of an emissions unit using coatings or solvents, the owner or operator shall document, through purchase receipts, records and sales receipts, the beginning and ending VOC inventories, the amount of VOC purchased during the computational period, and the amount of VOC disposed of in the liquid phase during such period.

(4) Emission Factors.

a. An owner or operator may use an emission factor to compute emissions of a pollutant for purposes of this rule provided the emission factor is based on site-specific data such as stack test data, where available, unless the owner or operator demonstrates to the department that an alternative emission factor is more accurate. An owner or operator using site-specific data to derive an emission factor, or set of factors, shall meet the following requirements.

1) If stack test data are used, the emission factor shall be based on the average emissions per unit of input, output, or gas volume, whichever is appropriate, of all valid stack tests conducted during at least a five-year period encompassing the period over which the emissions are being computed, provided all stack tests used shall represent the same operational and physical configuration of the unit.

2) Multiple emission factors shall be used as necessary to account for variations in emission rate associated with variations in the emissions unit's operating rate or operating conditions during the period over which emissions are computed.

3) The owner or operator shall compute emissions by multiplying the appropriate emission factor by the appropriate input, output or gas volume value for the period over which the emissions are computed. The owner or operator shall not compute emissions by converting an emission factor to pounds per hour and then multiplying by hours of operation, unless the owner or operator demonstrates that such computation is the most accurate method available.

b. If site-specific data are not available to derive an emission factor, the owner or operator may use a published emission factor directly applicable to the process for which emissions are computed. If no directly-applicable emission factor is available, the owner or operator may use a factor based on a similar, but different, process.

(5) Accounting for Emissions During Periods of Missing Data from CEMS, PEMS, or CPMS. In computing the emissions of a pollutant, the owner or operator shall account for the emissions during periods of missing data from CEMS, PEMS, or CPMS using other site-specific data to generate a reasonable estimate of such emissions.

(6) Accounting for Emissions During Periods of Startup and Shutdown. In computing the emissions of a pollutant, the owner or operator shall account for the emissions during periods of startup and shutdown of the emissions unit.

(7) Fugitive Emissions. In computing the emissions of a pollutant from a facility or emissions unit, the owner or operator shall account for the fugitive emissions of the pollutant, to the extent quantifiable, associated with such facility or emissions unit.

(8) Recordkeeping. The owner or operator shall retain a copy of all records used to compute emissions pursuant to this rule for a period of five years from the date on which such emissions information is submitted to the department for any regulatory purpose.

c. *Annual Operating Report for Air Pollutant Emitting Facility*

(1) The Annual Operating Report for Air Pollutant Emitting Facility (DEP Form No. 62-210.900(5)) shall be completed each year for the following facilities:

(a) All Title V sources.

(b) All synthetic non-Title V sources.

(c) All facilities with the potential to emit ten (10) tons per year or more of volatile organic compounds or twenty-five (25) tons per year or more of nitrogen oxides and located in an ozone nonattainment area or ozone air quality maintenance area.

(d) All facilities for which an annual operating report is required by rule or permit.

(2) Notwithstanding paragraph 62-210.370(3)(a), F.A.C., no annual operating report shall be required for any facility operating under an air general permit.

(3) The annual operating report shall be submitted to the appropriate Department of Environmental Protection (DEP) division, district or DEP-approved local air pollution control program office by April 1 of the following year.

(4) Beginning with 2007 annual emissions, emissions shall be computed in accordance with the provisions of subsection 62-210.370(2), F.A.C., for purposes of the annual operating report.

[RULE 62-210.370, F.A.C.]

CEMS OPERATION PLAN

1. CEMS Operation Plan: The owner or operator shall create and implement a facility-wide plan for the proper installation, calibration, maintenance and operation of each CEMS required by this permit. The owner or operator shall submit the CEMS Operation Plan to the Bureau of Air Monitoring and Mobile Sources for approval at least 60 days prior to CEMS installation. The CEMS Operation Plan shall become effective 60 days after submittal or upon its approval. If the CEMS Operation Plan is not approved, the owner or operator shall submit a new or revised plan for approval.

   {Permitting Note: The Department maintains both guidelines for developing a CEMS Operation Plan and example language that can be used as the basis for the facility-wide plan required by this permit. Contact the Emissions Monitoring Section of the Bureau of Air Monitoring and Mobile Sources at (850)488-0114.}

INSTALLATION, PERFORMANCE SPECIFICATIONS AND QUALITY ASSURANCE

2. Timelines:

   a. *New and Existing Emission Units.* For new emission units, the owner or operator shall install each CEMS required by this permit prior to initial startup of the unit. The owner or operator shall conduct the appropriate performance specification for each CEMS within 90 operating days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup.

3. Installation: All CEMS shall be installed such that representative measurements of emissions or process parameters from the facility are obtained. The owner or operator shall locate the CEMS by following the procedures contained in the applicable performance specification of 40 CFR part 60, Appendix B.

4. Span Values and Dual Range Monitors: The owner or operator shall set appropriate span values for the CEMS. The owner or operator shall install dual range monitors if required by and in accordance with the CEMS Operation Plan.

5. Continuous Flow Monitor: For compliance with mass emission rate standards, the owner or operator shall install a continuous flow monitor to determine the stack exhaust flow rate. The flow monitor shall be certified pursuant to 40 CFR part 60, Appendix B, Performance Specification 6.

6. Diluent Monitor: If it is necessary to correct the CEMS output to the oxygen concentrations specified in this permit's emission standards, the owner or operator shall either install an oxygen monitor or install a CO_2 monitor and use an appropriate F-Factor computational approach.

7. Moisture Correction: If necessary, the owner or operator shall determine the moisture content of the exhaust gas and develop an algorithm to enable correction of the monitoring results to a dry basis (0% moisture).

   {Permitting Note: The CEMS Operation Plan will contain additional CEMS-specific details and procedures for installation.}

8. Performance Specifications: The owner or operator shall evaluate the acceptability of each CEMS by conducting the appropriate performance specification, as follows. CEMS determined to be unacceptable shall not be considered installed for purposes of meeting the timelines of this permit.

   a. SO_2 CEMS: The SO_2 CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR 60, Appendices A and F.

   b. *CO Monitors:* For CO monitors, the owner or operator shall conduct Performance Specification 4 or 4A of 40 CFR part 60, Appendix B

   c. *NO_X Monitor:* For a NO_X monitor, the owner or operator shall conduct Performance Specification 2 of 40 CFR part 60, Appendix B.

d. *Hg Monitor*: The Hg CEMS shall be certified pursuant to the requirements in Performance Specification 12A (PS-12A), "Specifications and Test Procedures for Total Vapor phase Mercury Continuous Monitoring Systems in Stationary Sources," or that has passed verification tests conducted under the auspices of the U.S. Environmental Protection Agency's (EPA) Environmental Technology Verification (ETV) Program.

e. *COMS*: In accordance with 40 CFR 60.48b(a) the permittee shall install, calibrate, operate and maintain a continuous opacity monitor (COM) to continuously monitor and record opacity from the steam generating unit. The COMS shall be certified pursuant to 40 CFR 60 Appendix B, Performance Specification 1.

9. Quality Assurance: The owner or operator shall follow the quality assurance procedures of 40 CFR part 60, Appendix F.

a. *CO Monitors:* The required relative accuracy test audit (RATA) tests shall be performed using EPA Method 10 in Appendix A of 40 CFR part 60 and shall be based on a continuous sampling train.

b. *NO_X Monitors:* The required RATA tests shall be performed using EPA Method 7E in Appendix A of 40 CFR part 60. NO_X shall be expressed "as NO_2."

c. *SO_2 Monitors:* The required RATA tests shall be performed using EPA Method 6C in Appendix A of 40 CFR part 60.

d. *Hg Monitor*: After certification the owner or operator will begin reporting Hg concentration emissions data. The owner or operator shall adhere to the calibration drift and quarterly performance evaluation procedures and ongoing data quality assurance procedures in 40 CFR Part 60, Appendix F or 40 CFR Part 75, Appendix B. The mass emissions shall be estimated based on the actual data collected no later than 10 days following the end of the month. The mercury monitoring data results shall be submitted quarterly. The CEMS shall only be used as the method of compliance if the owner or operator, at a minimum, meets the requirements of 40 CFR 60.58b(n). Prior to use of the Hg-CEMS as the method to demonstrate compliance, the owner or operator shall submit written notice to the Department, and receive approval for missing data substitution and a data calculation approach plans.

10. Substituting RATA Tests for Compliance Tests: Data collected during CEMS quality assurance RATA tests can substitute for annual stack tests, and vice versa, at the option of the owner or operator, provided the owner or operator indicates this intent in the submitted test protocol and follows the procedures outlined in the CEMS Operation Plan.

CALCULATION APPROACH

11. CEMS Used for Compliance: Once adherence to the applicable performance specification for each CEMS is demonstrated, the owner or operator shall use the CEMS to demonstrate compliance with the long term 12 month rolling mean emission limits for NO_X, SO_2, CO and Hg emission standards as specified by this permit.

12. CEMS Data: Each CEMS shall monitor and record emissions during all periods of operation and whenever emissions are being generated, including during episodes of startups, shutdowns, and malfunctions. All data shall be used, except for invalid measurements taken during monitor system breakdowns, repairs, calibration checks, zero adjustments and span adjustments, and except for allowable data exclusions as per Condition 19 of this appendix.

13. Operating Hours and Operating Days: For purposes of this appendix, the following definitions shall apply. An hour is the 60-minute period beginning at the top of each hour. Any hour during which an emissions unit is in operation for more than 15 minutes is an operating hour for that emission unit. A day is the 24-

hour period from midnight to midnight. Unless otherwise specified by this permit, any day with at least one operating hour for an emissions unit is an operating day for that emission unit.

14. Valid Hourly Averages: Each CEMS shall be designed and operated to sample, analyze and record data evenly spaced over the hour at a minimum of one measurement per minute. All valid measurements collected during an hour shall be used to calculate a 1-hour block average that begins at the top of each hour.

    a. Hours that are not operating hours are not valid hours.

    b. For each operating hour, the 1-hour block average shall be computed from at least two data points separated by a minimum of 15 minutes. If less than two such data points are available, there is insufficient data, the 1-hour block average is not valid, and the hour is considered as "monitor unavailable."

15. Calculation Approaches: The owner or operator shall implement the calculation approach specified by this permit for each CEMS, as follows:

    a. *Rolling12-month average, rolled monthly:* Compliance shall be determined after each operating month by calculating the arithmetic average of all the valid hourly averages from that operating month and the prior x-1 operating months.

MONITOR AVAILABILITY

16. NO_X, SO_2 and CO Monitor Availability: The quarterly excess emissions report shall identify monitor availability for each quarter in which the unit operated. Monitor availability for each CEMS shall be 95% or greater in any calendar quarter in which each unit operated for more than 760 hours. In the event the applicable availability is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving the required availability and a plan of corrective actions that will be taken to achieve 95% availability. The permittee shall implement the reported corrective actions within the next calendar quarter. Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit.

17. Initial Hg Monitor Availability: During the initial four quarters of operation, the quarterly excess emissions report shall identify Hg CEMS availability for each calendar quarter in which the unit is operated. Monitor availability for the Hg CEMS shall be 85% or greater in any of the initial four calendar quarters in which the unit operated for more than 760 hours. In the event the availability is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving the required availability and a plan of corrective actions that will be taken to achieve 85% availability. The permittee shall implement the reported corrective actions within the next calendar quarter. Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit.

18. Subsequent Hg Monitor Availability: During subsequent calendar quarters of operation, the Hg CEMS availability shall be 95% or greater in any calendar quarter in which the unit is operated for more than 760 hours. The reporting and corrective actions along with actions that shall be considered violations of this permit are specified in **Specific Condition 17** of this appendix.

EXCESS EMISSIONS

19. Definitions:

    a. *Startup* is defined as the commencement of operation of any emissions unit which has shut down or ceased operation for a period of time sufficient to cause temperature, pressure, chemical or pollution control device imbalances, which result in excess emissions.

    b. *Shutdown* means the cessation of the operation of an emissions unit for any purpose.

    c. *Malfunction* means any unavoidable mechanical and/or electrical failure of air pollution control

equipment or process equipment or of a process resulting in operation in an abnormal or unusual manner.

20. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.

21. Data Exclusion Procedures for SIP Compliance: As per the procedures in this condition, limited amounts of CEMS emissions data may be excluded from the corresponding compliance demonstration, provided that best operational practices to minimize emissions are adhered to and the duration of data excluded is minimized. The data exclusion procedures of this condition apply only to SIP-based emission limits.

    a. *Excess Emissions.* Data in excess of the applicable emission standard may be excluded from compliance calculations if the data are collected during periods of permitted excess emissions (for example, during startup, shutdown or malfunction). The maximum duration of excluded data is 2 hours in any 24-hour period, unless some other duration is specified by this permit. For the CEMS on the TO stack, mass based excess emissions of NO_x, CO, SO_2 and Hg during periods of startup, shutdown and malfunction cannot be excluded. This is due to the long term nature (12 month rolling) of the emission limits.

    b. *Limited Data Exclusion.* If the compliance calculation using all valid CEMS emission data, as defined in Condition 12 of this appendix, indicates that the emission unit is in compliance, then no CEMS data shall be excluded from the compliance demonstration.

    c. *Event Driven Exclusion.* The underlying event (for example, the startup, shutdown or malfunction event) must precede the data exclusion. If there is no underlying event, then no data may be excluded. Only data collected during the event may be excluded.

    d. *Reporting Excluded Data.* The data exclusion procedures of this condition are not necessarily the same procedures used for excess emissions as defined by federal rules. Quarterly or semi-annual reports required by this permit shall indicate not only the duration of data excluded from SIP compliance calculations but also the number of excess emissions as defined by federal rules.

22. Notification Requirements: The owner or operator shall notify the Compliance Authority within one working day of discovering any emissions that demonstrate noncompliance for a given averaging period. Within one working day of occurrence, the owner or operator shall notify the Compliance Authority of any malfunction resulting in the exclusion of CEMS data. For malfunctions, notification is sufficient for the owner or operator to exclude CEMS data.

ANNUAL EMISSIONS

23. CEMS Used for Calculating Annual Emissions: All valid data, as defined in Condition 12 of this appendix, shall be used when calculating annual emissions.

    a. Annual emissions shall include data collected during startup, shutdown and malfunction periods.

    b. Annual emissions shall include data collected during periods when the emission unit is not operating but emissions are being generated (for example, when firing fuel to warm up a process for some period of time prior to the emission unit's startup).

    c. Annual emissions shall not include data from periods of time where the monitor was functioning properly but was unable to collect data while conducting a mandated quality assurance/quality control activity such as calibration error tests, RATA, calibration gas audit or RAA. These periods of time shall be considered missing data for purposes of calculating annual emissions.

d. Annual emissions shall not include data from periods of time when emissions are in excess of the calibrated span of the CEMS. These periods of time shall be considered missing data for purposes of calculating annual emissions.

24. Accounting for Missing Data: All valid measurements collected during each hour shall be used to calculate a 1-hour block average. For each hour, the 1-hour block average shall be computed from at least two data points separated by a minimum of 15 minutes. If less than two such data points are available, the owner or operator shall account for emissions during that hour using site-specific data to generate a reasonable estimate of the 1-hour block average.

25. Emissions Calculation: Hourly emissions shall be calculated for each hour as the product of the 1-hour block average and the duration of pollutant emissions during that hour. Annual emissions shall be calculated as the sum of all hourly emissions occurring during the year.

CITATION FORMATS

The following illustrate the formats used in the permit to identify applicable requirements from permits and regulations.

Old Permit Numbers

Example: Permit No. AC50-123456 or Permit No. AO50-123456

Where: "AC" identifies the permit as an Air Construction Permit
"AO" identifies the permit as an Air Operation Permit
"123456" identifies the specific permit project number

New Permit Numbers

Example: Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

Where: "099" represents the specific county ID number in which the project is located
"2222" represents the specific facility ID number for that county
"001"identifies the specific permit project number
"AC" identifies the permit as an air construction permit
"AF" identifies the permit as a minor source federally enforceable state operation permit
"AO" identifies the permit as a minor source air operation permit
"AV" identifies the permit as a major Title V air operation permit

PSD Permit Numbers

Example: Permit No. PSD-FL-317

Where: "PSD" means issued pursuant to the preconstruction review requirements of the Prevention of Significant Deterioration of Air Quality
"FL" means that the permit was issued by the State of Florida
"317" identifies the specific permit project number

Florida Administrative Code (F.A.C.)

Example: [Rule 62-213.205, F.A.C.]

Means: Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

Code of Federal Regulations (CFR)

Example: [40 CRF 60.7]

Means: Title 40, Part 60, Section 7

GLOSSARY OF COMMON TERMS

° F: degrees Fahrenheit

acfm: actual cubic feet per minute

ARMS: Air Resource Management System (Department's database)

BACT: best available control technology

Btu: British thermal units

CAM: compliance assurance monitoring

CEMS: continuous emissions monitoring system

cfm: cubic feet per minute

CFR: Code of Federal Regulations

CO: carbon monoxide

COMS: continuous opacity monitoring system

DEP: Department of Environmental Protection

Department: Department of Environmental Protection

dscfm: dry standard cubic feet per minute

EPA: Environmental Protection Agency

ESP: electrostatic precipitator (control system for reducing particulate matter)

EU: emissions unit

F.A.C.: Florida Administrative Code

F.D.: forced draft

F.S.: Florida Statutes

FGR: flue gas recirculation

F: fluoride

ft^2: square feet

ft^3: cubic feet

gpm: gallons per minute

gr: grains

HAP: hazardous air pollutant

Hg: mercury

I.D.: induced draft

ID: identification

kPa: kilopascals

lb: pound

MACT: maximum achievable technology

MMBtu: million British thermal units

MSDS: material safety data sheets

MW: megawatt

NESHAP: National Emissions Standards for Hazardous Air Pollutants

NO_x: nitrogen oxides

NSPS: New Source Performance Standards

O&M: operation and maintenance

O_2: oxygen

Pb: lead

PM: particulate matter

PM_{10}: particulate matter with a mean aerodynamic diameter of 10 microns or less

PSD: prevention of significant deterioration

psi: pounds per square inch

PTE: potential to emit

RACT: reasonably available control technology

RATA: relative accuracy test audit

SAM: sulfuric acid mist

scf: standard cubic feet

scfm: standard cubic feet per minute

SIC: standard industrial classification code

SNCR: selective non-catalytic reduction (control system used for reducing emissions of nitrogen oxides)

SO_2: sulfur dioxide

TPH: tons per hour

TPY: tons per year

UTM: Universal Transverse Mercator coordinate system

VE: visible emissions

VOC: volatile organic compounds

Application

Geoplasma: Geoplasma-St Lucie, LLC

TO: Thermal Oxidizer

Snygas: synthetic gas

HRSG: heat recovery steam generators

STG: Steam Turbine Electrical Generator

CEMS: continuous emissions monitoring system

COMS: continuous opacity monitoring system

Unless otherwise specified in the permit, the following testing requirements apply to all emissions units at the Geoplasma facility.

COMPLIANCE TESTING REQUIREMENTS

1. Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. [Rule 62-297.310(2), F.A.C.]

2. Applicable Test Procedures - Opacity Compliance Tests. When either EPA Method 9 or DEP Method 9 is specified as the applicable opacity test method, the required minimum period of observation for a compliance test shall be sixty (60) minutes for emissions units which emit or have the potential to emit 100 tons per year or more of particulate matter, and thirty (30) minutes for emissions units which have potential emissions less than 100 tons per year of particulate matter and are not subject to a multiple-valued opacity standard. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur. Exceptions to these requirements are as follows:

   a. For batch, cyclical processes, or other operations which are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the batch cycle or operation completion time.

   b. The observation period for special opacity tests that are conducted to provide data to establish a surrogate standard pursuant to Rule 62-297.310(5)(k), F.A.C., Waiver of Compliance Test Requirements, shall be established as necessary to properly establish the relationship between a proposed surrogate standard and an existing mass emission limiting standard.

   c. The minimum observation period for opacity tests conducted by employees or agents of the Department to verify the day-to-day continuing compliance of a unit or activity with an applicable opacity standard shall be twelve minutes.

   [Rule 62-297.310(4), F.A.C.]

3. Determination of Process Variables.

   a. *Required Equipment.* The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

   b. *Accuracy of Equipment.* Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

   [Rule 62-297.310(5), F.A.C.]

4. Frequency of Compliance Tests: The following provisions apply only to those emissions units that are subject to an emissions limiting standard for which compliance testing is required.

   a. *General Compliance Testing.*

1. The owner or operator of a new or modified emissions unit that is subject to an emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining an operation permit for such emissions unit.
2. The owner or operator of an emissions unit that is subject to any emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining a renewed operation permit. Emissions units that are required to conduct an annual compliance test may submit the most recent annual compliance test to satisfy the requirements of this provision.

   In renewing an air operation permit pursuant to sub-subparagraph 62-210.300(2)(a)3.b., c., or d., F.A.C., the Department shall not require submission of emission compliance test results for any emissions unit other than the emergency flare system (EU 003) that, during the year prior to renewal:

   (a) Did not operate; or

   (b) In the case of a fuel burning emissions unit, burned liquid and/or solid fuel for a total of no more than 400 hours,
3. During each federal fiscal year (October 1 – September 30), unless otherwise specified by rule, order, or permit, the owner or operator of each emissions unit shall have a formal compliance test conducted for visible emissions, if there is an applicable standard.
4. The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator.

b. *Special Compliance Tests*: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department.

[Rule 62-297.310(7), F.A.C.]

RECORDS AND REPORTS

5. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report shall provide the following information.

   a. The type, location, and designation of the emissions unit tested.

   b. The facility at which the emissions unit is located.

   c. The owner or operator of the emissions unit.

   d. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.

   e. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.

f. The date, starting time and end time of the observation.

g. The test procedures used.

h. The names of individuals who furnished the process variable data, conducted the test, and prepared the report.

i. The applicable emission standard and the resulting maximum allowable emission rate for the emissions unit plus the test result in the same form and unit of measure.

j. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8), F.A.C.]

NSPS, 40 CFR 60, SUBPART DB – STANDARDS OF PERFORMANCE INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

A 216 mmBtu/hr auxiliary boiler firing natural gas that will be used to produce steam when the gasifier is not in operation is regulated under this NSPS. It is designated as Emissions Unit 007.

The entire regulation is accessible at the following link:

Link to NSPS Subpart Db

NSPS, 40 CFR 60, SUBPART EB – STANDARDS OF PERFORMANCE FOR LARGE MUNICIPAL WASTE COMBUSTORS STEAM GENERATING UNITS

Applicability of 40CFR60, Subpart Eb- Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994 or for Which Modification or Reconstruction is Commenced After June 19, 1996.

The proposed Geoplasma facility is a new Large Municipal Waste Combustor (Large MWC) because it is a waste combustion unit that is capable of combusting more than 250 tons per day (TPD) of municipal solid waste (MSW).

The rules applicable to Large MWC's are given at 40CFR60, Sections 60.50b through 60.59b. More specifically, the SLPG facility utilizes gasification of MSW to generate electrical power. The emission limits applicable to this category of MWC are specified by in the relevant sections, paragraphs and tables that address individual pollutants including CO, NO_X, SO_2, HCl, PM, dioxin/furan, opacity, Cd, Hg, Pb, and various emission monitoring and operational parameters.

The Department has insured that the Permit is at least as stringent, and in most case much more stringent, than the requirements of Subpart Eb, including the use of Hg-CEMS.

A link to 40 CFR 60, Subpart Eb is available below.

Link to NSPS Subpart Eb

GENERAL CONDITIONS

The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
   a. Have access to and copy and records that must be kept under the conditions of the permit;
   b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
   c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.
8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
   a. A description of and cause of non-compliance; and
   b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

   The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
    a. Determination of Best Available Control Technology ( );
    b. Determination of Prevention of Significant Deterioration ( ); and
    c. Compliance with New Source Performance Standards (X).
14. The permittee shall comply with the following:
    a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
    c. Records of monitoring information shall include:
        1) The date, exact place, and time of sampling or measurements;
        2) The person responsible for performing the sampling or measurements;
        3) The dates analyses were performed;
        4) The person responsible for performing the analyses;
        5) The analytical techniques or methods used; and
        6) The results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

NSPS, 40 CFR 60, SUBPART IIII – STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

A 500 kW or less emergency generator (EU ID 005) and a 335 hp or less fire pump (EU-005) are proposed for the Geoplasma facility and are subject to the applicable requirements of 40 CFR 60, Subpart IIII--Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The provisions of this Subpart may be provided in full upon request and are also available at the following link:

Link to NSPS Subpart IIII

NESHAP, 40 CFR 63, SUBPART ZZZZ – STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

A 500 kW or less emergency generator (EU ID 005) and a 335 hp or less fire pump (EU-005) are proposed for the Geoplasma facility and they are subject to the requirements of 40 CFR 63, Subpart ZZZZ--National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. The complete provisions of Subpart ZZZZ may be provided in full upon request and are also available beginning at Section 63.6580 at:

Link to NESHAP Subpart ZZZZ

Livingston, Sylvia

From: Livingston, Sylvia
Sent: Tuesday, May 25, 2010 4:28 PM
To: 'hillestad@geoplasma.com'
Cc: 'lshapiro@energyresourcesgrp.com'; 'robertsr@stlucico.gov'; 'neeley.doug@epa.gov'; 'abrams.heather@epa.gov'; Chisolm, Jack; Anderson, Lennon; 'davidmickey@bellsouth.net'; Gibson, Victoria; Read, David; Linero, Alvaro; Vielhauer, Trina; Walker, Elizabeth (AIR)
Subject: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC
Attachments: StLucieIntent.pdf

Dear Sir/ Madam:

Attached is the official **Notice of Intent to Issue** for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, noting that you can view the documents, and then selecting "Send".

Note: We must receive verification that you are able to access the documents. Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).

Click on the following link to access the permit project documents:

http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/1110138.001.AC.D_pdf.zip

Owner/Company Name: GEOPLASMA-ST. LUCIE, LLC
Facility Name: ST. LUCIE PLASMA GASIFICATION FACILITY
Project Number: 1110138-001-AC
Permit Status: DRAFT
Permit Activity: CONSTRUCTION
Facility County: ST. LUCIE
Processor: David Read

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "*Air Permit Documents Search*" website at http://www.dep.state.fl.us/air/emission/apds/default.asp.

Permit project documents are addressed in this email may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible, and verify that they are accessible. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record. If you have any problems opening the documents or would like further information, please contact the Florida Department of Environmental Protection, Bureau of Air Regulation

Sylvia Livingston
Bureau of Air Regulation
Division of Air Resource Management (DARM)
850/921-9506
sylvia.livingston@dep.state.fl.us

Livingston, Sylvia

From: lshapiro@energyresourcesgrp.com
Sent: Tuesday, May 25, 2010 4:50 PM
To: Livingston, Sylvia
Cc: hillestad@geoplasma.com
Subject: Re: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

To: Sylvia Livingston
Bureau of Air Regulation
Division of Air Resource Management (DARM)
850/921-9506
sylvia.livingston@dep.state.fl.us<mailto:sylvia.livingston@dep.state.fl.us>

This will confirm verification that we are able to access documents.

Thank you,
Len Shapiro
Energy Resources Group, Inc

Geoplasma-St Lucie, LLC

Phone: 561-368-4241

On May 25, 2010 at 8:27 PM "Livingston, Sylvia" <Sylvia.Livingston@dep.state.fl.us> wrote:

> Dear Sir/ Madam:
> Attached is the official Notice of Intent to Issue for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, noting that you can view the documents, and then selecting "Send".
> Note: We must receive verification that you are able to access the documents. Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).
> Click on the following link to access the permit project documents:
> http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/1110138.001.AC.D_pdf.zip
>
> Owner/Company Name: GEOPLASMA-ST. LUCIE, LLC
> Facility Name: ST. LUCIE PLASMA GASIFICATION FACILITY
> Project Number: 1110138-001-AC
> Permit Status: DRAFT
> Permit Activity: CONSTRUCTION

> Facility County: ST. LUCIE
>
> Processor: David Read
> The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "Air Permit Documents Search" website at http://www.dep.state.fl.us/air/emission/apds/default.asp.
> Permit project documents are addressed in this email may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible, and verify that they are accessible. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record. If you have any problems opening the documents or would like further information, please contact the Florida Department of Environmental Protection, Bureau of Air Regulation
>
> Sylvia Livingston
> Bureau of Air Regulation
> Division of Air Resource Management (DARM)
> 850/921-9506
>
sylvia.livingston@dep.state.fl.us<mailto:sylvia.livingston@dep.state.fl.us
>
>
> Note: The attached document is in Adobe Portable Document Format (pdf). Adobe Acrobat Reader can be downloaded for free at the following internet site: <http://www.adobe.com/products/acrobat/readstep.html> .
>
>
>
>
>
>
> The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey<http://survey.dep.state.fl.us/?refemail=Sylvia.Livingston@dep.state.fl.us>. Thank you in advance for completing the survey.

Livingston, Sylvia

From: Ron Roberts [robertsr@stlucieco.org]
Sent: Wednesday, May 26, 2010 8:19 AM
To: Livingston, Sylvia
Subject: RE: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

Received.

From: Livingston, Sylvia [mailto:Sylvia.Livingston@dep.state.fl.us]
Sent: Wednesday, May 26, 2010 7:50 AM
To: Ron Roberts
Subject: FW: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

Dear Sir/ Madam:

Attached is the official **Notice of Intent to Issue** for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, noting that you can view the documents, and then selecting "Send".

Note: We must receive verification that you are able to access the documents. Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).

Click on the following link to access the permit project documents:

http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/1110138.001.AC.D_pdf.zip

Owner/Company Name: GEOPLASMA-ST. LUCIE, LLC
Facility Name: ST. LUCIE PLASMA GASIFICATION FACILITY
Project Number: 1110138-001-AC
Permit Status: DRAFT
Permit Activity: CONSTRUCTION
Facility County: ST. LUCIE
Processor: David Read

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "*Air Permit Documents Search*" website at http://www.dep.state.fl.us/air/emission/apds/default.asp.

Permit project documents are addressed in this email may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible, and verify that they are accessible. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record. If you have any problems opening the documents or would like further information, please contact the Florida Department of Environmental Protection, Bureau of Air Regulation

Sylvia Livingston
Bureau of Air Regulation
Division of Air Resource Management (DARM)
850/921-9506

Livingston, Sylvia

From: david mickey [davidmickey@bellsouth.net]
Sent: Wednesday, May 26, 2010 7:59 AM
To: Livingston, Sylvia
Subject: Re: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

I have received and can access the documents. Thanks.
David Mickey
Blue Ridge Environmental Defense League

From: "Livingston, Sylvia" <Sylvia.Livingston@dep.state.fl.us>
To: "hillestad@geoplasma.com" <hillestad@geoplasma.com>
Cc: "lshapiro@energyresourcesgrp.com" <lshapiro@energyresourcesgrp.com>; "robertsr@stlucico.gov" <robertsr@stlucico.gov>; "neeley.doug@epa.gov" <neeley.doug@epa.gov>; "abrams.heather@epa.gov" <abrams.heather@epa.gov>; "Chisolm, Jack" <Jack.Chisolm@dep.state.fl.us>; "Anderson, Lennon" <Lennon.Anderson@dep.state.fl.us>; "davidmickey@bellsouth.net" <davidmickey@bellsouth.net>; "Gibson, Victoria" <Victoria.Gibson@dep.state.fl.us>; "Read, David" <David.Read@dep.state.fl.us>; "Linero, Alvaro" <Alvaro.Linero@dep.state.fl.us>; "Vielhauer, Trina" <Trina.Vielhauer@dep.state.fl.us>; "Walker, Elizabeth (AIR)" <Elizabeth.Walker@dep.state.fl.us>
Sent: Tue, May 25, 2010 4:27:46 PM
Subject: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

Dear Sir/ Madam:

Attached is the official **Notice of Intent to Issue** for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, noting that you can view the documents, and then selecting "Send".

Note: We must receive verification that you are able to access the documents. Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).

Click on the following link to access the permit project documents:

http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/1110138.001.AC.D_pdf.zip

Owner/Company Name: GEOPLASMA-ST. LUCIE, LLC
Facility Name: ST. LUCIE PLASMA GASIFICATION FACILITY
Project Number: 1110138-001-AC
Permit Status: DRAFT
Permit Activity: CONSTRUCTION
Facility County: ST. LUCIE
Processor: David Read

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "*Air Permit Documents Search*" website at http://www.dep.state.fl.us/air/emission/apds/default.asp.

Livingston, Sylvia

From: Vielhauer, Trina
Sent: Wednesday, May 26, 2010 7:36 AM
To: Livingston, Sylvia
Subject: RE: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

Got it

From: Livingston, Sylvia
Sent: Tuesday, May 25, 2010 4:28 PM
To: hillestad@geoplasma.com
Cc: lshapiro@energyresourcesgrp.com; robertsr@stlucico.gov; neeley.doug@epa.gov; abrams.heather@epa.gov; Chisolm, Jack; Anderson, Lennon; davidmickey@bellsouth.net; Gibson, Victoria; Read, David; Linero, Alvaro; Vielhauer, Trina; Walker, Elizabeth (AIR)
Subject: Geoplasma - St. Lucie, LLC - St. Lucie Plasma Gasification Waste-to-Energy Facility; 1110138-001-AC

Dear Sir/ Madam:

Attached is the official **Notice of Intent to Issue** for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, noting that you can view the documents, and then selecting "Send".

Note: We must receive verification that you are able to access the documents. Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).

Click on the following link to access the permit project documents:

http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/1110138.001.AC.D_pdf.zip

Owner/Company Name: GEOPLASMA-ST. LUCIE, LLC
Facility Name: ST. LUCIE PLASMA GASIFICATION FACILITY
Project Number: 1110138-001-AC
Permit Status: DRAFT
Permit Activity: CONSTRUCTION
Facility County: ST. LUCIE
Processor: David Read

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "*Air Permit Documents Search*" website at http://www.dep.state.fl.us/air/emission/apds/default.asp.

Permit project documents are addressed in this email may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible, and verify that they are accessible. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record. If you have any problems opening the documents or would like further information, please contact the Florida Department of Environmental Protection, Bureau of Air Regulation

Sylvia Livingston